U.S. DEPARTMENT OF COMMERCE
National Technical Information Service

PB-260 234

REPORT ON POLLUTION OF INTERSTATE WATERS OF THE PEARL AND EAST PEARL RIVERS, LOUISIANA-MISSISSIPPI

ROBERT A. TAFT SANITARY ENGINEERING CENTER
CINCINNATI, OHIO

PREPARED FOR
PUBLIC HEALTH SERVICE, ATLANTA, GA.

SEPTEMBER 1963

Property of
Robert S. Kerr Water Research Center
Library

25316

PB 260 234

Library

REPORT ON

POLLUTION OF INTERSTATE WATERS

OF THE

PEARL AND EAST PEARL RIVERS
LOUISIANA-MISSISSIPPI

REPRODUCED BY
NATIONAL TECHNICAL
INFORMATION SERVICE
U. S. DEPARTMENT OF COMMERCE
SPRINGFIELD, VA. 22161

U. S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
ROBERT A. TAFT SANITARY ENGINEERING CENTER
CINCINNATI, OHIO

AND

REGION IV OFFICE, ATLANTA, GEORGIA

SEPTEMBER 1963

BIBLIOGRAPHIC DATA SHEET

1. Report No.

2.

3. Recipient's Accession No. PB-260 234

4. Title and Subtitle
Report on pollution of Interstate Waters of the Pearl and East Pearl Rivers, Louisiana-Mississippi.

5. Report Date
Sep 63

6.

7. Author(s)

8. Performing Organization Rept. No.

9. Performing Organization Name and Address
Robert A. Taft Sanitary Engineering Center,
Cincinnati, Ohio.

10. Project/Task/Work Unit No.

11. Contract/Grant No.

12. Sponsoring Organization Name and Address
Public Health Service, Atlanta, Ga. Region IV.

13. Type of Report & Period Covered

14.

15. Supplementary Notes
Prepared in cooperation with Public Health Service, Atlanta, Ga. Region IV.

16. Abstracts

The Pearl River survey was based on the HEW belief that pollution of interstate waters of the Pearl River and the East Pearl River, by wastes originating in Louisiana and Mississippi, was endangering the health or welfare of persons in Louisiana and Mississippi. Descriptions are offered for water uses (water supply, recreation, stock watering, navigation, and shell fishing); and sources of wastes. Appended are data on chemical and bacteriological data, biological data, and computation of oxygen sag.

17. Key Words and Document Analysis. 17a. Descriptors

17b. Identifiers/Open-Ended Terms

Oxygen sag
Chemical analysis
Bacteria
Pearl River
Louisiana
Mississippi
*Water pollution sampling
*Water quality data
Public health
Drinking water
Recreation
Water sources
Fishes
Waste disposal
East Pearl River

17c. COSATI Field/Group 13B

18. Availability Statement

19. Security Class (This Report) UNCLASSIFIED

20. Security Class (This Page UNCLASSIFIED

21. No. of Pages 147

22. Price

FORM NTIS-35 (REV. 10-73) ENDORSED BY ANSI AND UNESCO. THIS FORM MAY BE REPRODUCED USCOMM-DC 8265-P74

PEARL RIVER SURVEY

ACKNOWLEDGEMENTS

This report on the Pearl River was prepared by John M. Fairall, Chemical Engineering Consultant.

The field study was organized and directed by A. W. West, Public Health Engineer.

Pearce Klazer, Senior Assistant Sanitary Engineer, was Assistant Project Engineer for field surveys and report preparation.

Biological studies were performed, and the biological section of this report was prepared, by L. E. Keup with J. R. Geckler under the supervision of K. M. Mackenthun, Biologists.

All work was performed under supervision of F. W. Kittrell, Engineer-in-Charge, Pollution Evaluation Unit of the Technical Advisory and Investigations Section at the Robert A. Taft Sanitary Engineering Center in Cincinnati, Ohio.

Valuable assistance, cooperation and contributions were generously provided by others on the Staff of the Robert A. Taft Sanitary Engineering Center, Atlanta Regional Office, Dallas Regional Office, Mississippi State Board of Health, Mississippi Game & Fish Commission, Louisiana State Board of Health, Louisiana State Stream Control Commission, Mobile District U. S. Army Corps of Engineers, Mississippi and Louisiana Districts of the U. S. Department of Interior, Geological Survey, City of Bogalusa, Louisiana, other agencies, and Crown Zellerbach Corporation.

TABLE OF CONTENTS

PAGE

INTRODUCTION 1

BACKGROUND 2

  PREVIOUS SURVEYS 2

    U. S. Public Health Service 2

    Louisiana 2

  PRESENT SURVEY 5

THE RIVERS 6

  THE LOWER PEARL 6

  THE EAST PEARL 7

  SALT WATER 8

WATER USES 9

  WATER SUPPLY 9

  RECREATION 9

  STOCK WATERING 9

  NAVIGATION 10

  SHELL FISHING 10

SOURCES OF WASTES 11

  MUNICIPAL 11

  INDUSTRIAL WASTES 12

PRESENTATION OF DATA 13

  GENERAL 13

  LOWER PEARL RIVER 13

    Bogue Lusa and Coburn Creek 17

    Biological Investigations 18

TABLE OF CONTENTS
(Continued)

PAGE

Coliform Bacteria 22

Biochemical Oxygen Demand 23

Dissolved Oxygen 24

Oxygen Sag Curve 25

1963 Data 27

EAST PEARL RIVER 29

Biological Investigations 29

Coliform Bacteria 31

Biochemical Oxygen Demand 32

Dissolved Oxygen 33

Crosby Chemicals, Inc. 33

EFFECTS OF WASTES ON WATER QUALITY 37

LOWER PEARL 37

EAST PEARL 38

SALT WATER 40

SUMMARY AND CONCLUSION 41

TABLE OF CONTENTS

APPENDICES

PAGE

SUPPLEMENTARY REPORT ON UPPER PEARL RIVER 44

BACKGROUND 44

PREVIOUS SURVEY 44

PRESENT SURVEY 44

THE AREA 45

WATER USES 45

WATER SUPPLY 45

RECREATION 45

STOCK WATERING 45

SOURCES OF WASTE 46

MUNICIPAL 46

INDUSTRIAL WASTES 46

PRESENTATION OF DATA 47

GENERAL 47

STRONG RIVER 50

JACKSON 50

TERRY 52

MONTICELLO 52

COLUMBIA 52

EFFECTS OF WASTES ON WATER QUALITY 53

TABLE OF CONTENTS

APPENDICES
(Continued)

APPENDIX A

PAGE

CHEMICAL AND BACTERIOLOGICAL DATA 54

  SAMPLING 54

  OTHER DATA 80

    Long-Term B.O.D. 80

    Sewer Analyses, Crown Zellerbach Corp. . 80

APPENDIX B

BIOLOGICAL DATA 83

  BASIC BIOLOGICAL PRINCIPLES 83

  METHODS OF SURVEY 84

APPENDIX C

COMPUTATION OF OXYGEN SAG 90

  SURVEY PERIOD 90

    Long-Term B.O.D. 90

    Time of Passage 90

    B.O.D. 92

    D.O. 97

    Projected Oxygen Deficits 104

    Existing Waste Load 108

    Existing Load with Sedimentation . . . 109

    Future Conditions 110

REFERENCES 111

LIST OF FIGURES

FIGURE NO.	FOLLOWS PAGE NO.
1	6
2	6
3	7
4	18
5	18
6	22
7	23
8	24
9	25
10	25
11	29
12	29
13	31
14	32
15	32
16	33
17	34
18	34
19	34
20	45
21	50
22	50
23	50
C-1	93
C-2	98
C-3	101
C-4	102
C-5	106

LIST OF TABLES

TABLE NO.	FOLLOWS PAGE NO.
1	13
2	13
3	16
4	17
5	47
6	47
A-1 to A-24	55
A-25	80
A-26	80
B-1 to B-4	84
C-1	92
C-2	92
C-3	95
C-4	97
C-5	99
C-6	104

PEARL RIVER SURVEY

INTRODUCTION

In a letter dated December 14, 1961, Dr. A. L. Gray, Executive Officer of the Mississippi State Board of Health, indicated a vital concern regarding the quality of the water of the Pearl River and requested the U. S. Public Health Service to make a water quality study of the stream.

On the basis of the requested study, this survey and other information which caused the Secretary of Health, Education and Welfare to believe that pollution of interstate waters of the Pearl River and the East Pearl River, by wastes originating in Louisiana and Mississippi, was endangering the health or welfare of persons in Louisiana and Mississippi, the Secretary called a conference to review the problem in New Orleans, Louisiana, on October 22, 1963.

BACKGROUND

PREVIOUS SURVEYS

U. S. Public Health Service

A previous survey of the Pearl River was made by the U. S. Public Health Service during late October and early November 1950.[1] This previous survey was confined to that reach of the Pearl River from the mouth of Bogue Lusa Creek to a point 43 miles downstream (River Mile 32). The East Pearl River was not involved in this survey. During the period of the survey the flow was between 2,300 and 2,900 cubic feet per second and the lowest D.O. value observed in the river was 5.5 mg/l. This maximum oxygen depletion occurred between 18 and 24 miles below the mouth of Bogue Lusa Creek (River Miles 57 and 51). During the survey it was observed that the clean water organisms had disappeared below the sources of pollution and did not reappear within 43 miles. Based on the observed loading the minimum D.O. expected to occur on an average of once in ten years, at 1,250 cubic feet per second and 28° C, was 0.4 ppm approximately 0.3 days flow time below the mouth of Bogue Lusa Creek.

Louisiana

During the period of March 1961 to August 1962, the Division of Water Pollution Control of the Louisiana Wildlife and Fisheries Commission conducted a number of surveys on the Pearl River, from Bogue Lusa Creek to Walkiah Bluff, covering substantially the same problem and streams discussed in the 1950 U. S. Public Health Service report. The results of these Louisiana surveys were reported in August, 1962.[2]

Low values of D.O. were observed at a point 9 miles below Bogue Lusa Creek (Pool's Bluff, P-64) and again approximately 20 to 25 miles below Bogue Lusa Creek (P-55 and P-50). A minimum D.O. of 3.8 mg/l was observed at Pool's Bluff with a stream flow of 2,200 cubic feet per second. "Very susceptible clean water benthic forms" were eliminated from Bogue Lusa Creek to Walkiah Bluff." "... Moderately tolerant benthic forms . . ." were eliminated from Bogue Lusa Creek to 8 - 10 miles below Pool' Bluff and ". . . absolute and relative abundance of highly tolerant benthic forms . . . " increased in the same reach.

From March 1961 to August 1962, fourteen grab samples were collected from the east and west sewers of the Crown Zellerbach integrated kraft mill at Bogalusa. The rate of discharge of wastes, expressed as pounds of biological chemical demand per day, varied from 26,901 to 129,923 pounds per day with an average value of 76,167.[2]

An addendum to the report was issued in October 1962.[3] Among other information this addendum indicated that the Bogalusa Division of the Crown Zellerbach Corporation had a pending application (before the Stream Control Commission) for discharging primary treated wastes from the production of 1500 tons of paper per day, containing 62,000 pounds per day of B.O.D.

In October, 1962, the Louisiana State Board of Health issued a report "Louisiana Oyster Water Survey, 1962, Pearl River-Mississippi Sound."[4] A sanitary survey of the Louisiana waters indicated that the most likely sources of pollution potentially affecting the oyster harvesting areas appeared to be:

1. Discharge from several distributaries of the Pearl River
2. Flow from Lake Borgne into the Sound
3. Under certain wind and tidal conditions, the discharge from the Jordan and Wolf Rivers in Mississippi

"Other possible sources of contamination are storm flow and untreated or partially treated sewage from the heavily populated coastal strip extending from St. Louis Bay to Biloxi, and the sewage discharge from vessels operating in the vicinity (the Intercoastal Waterway traverses the waters in question and carries a fairly heavy traffic)."

A sampling program, including the likely sources of pollution was commenced in December, 1961, and concluded in July, 1962. The waters of the Sound were sampled on three dates in August and September, 1962, following very low stages on the Pearl River. It was concluded that the water quality of the Mississippi Sound was not adversely affected, and "that the oyster-growing waters are of excellent quality from the public health viewpoint and are judged to comply with the most stringent provisions and conditions set out in the U. S. Public Health Service publication 'Sanitary Control of the Shellfish Industry' and should, therefore, be classified as 'Approved'."[4]

It was recommended that the report be supplemented by data to be collected when practicable during medium and high river stages, when bacteria from upstream sources of pollution might be carried out to the oyster beds.

PRESENT SURVEY

This survey and report are made in response to the request by Dr. Gray of the Mississippi State Board of Health. The principal period of sampling was from September 11 to October 2, 1962. U. S. Public Health Service personnel collected samples on the East Pearl River from U. S. 90 to above Picayune, Mississippi, and on the Lower Pearl from U. S. 90 to the drawbridge across the Pearl River above the mouth of the Bogue Lusa Creek at Louisiana State Highway 10. All of these samples were analyzed at the U. S. Public Health Service trailer laboratory at Bogalusa, Louisiana, or else preserved and returned to Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio. Samples collected on the Pearl River downstream from U. S. 90 and out into the salt water area were collected and analyzed by the Mississippi State Board of Health laboratory at Gulfport, Mississippi.

THE RIVERS

The Pearl River System is shown in Figure 1. For the purposes of this report the Pearl River System may be divided into three reaches or divisions; the Upper Pearl, the Lower Pearl which includes the West Pearl and the East Pearl. The principal part of this report is limited to the interstate waters of the Lower Pearl and the East Pearl, forming the boundary between Mississippi and Louisiana. The Upper Pearl is considered in a supplementary report bound in the Appendix.

THE LOWER PEARL

The drawbridge for Louisiana State Highway No. 10 at Bogalusa and the ramp for unloading barges at Richardson's Landing are the upstream signs of the navigable Lower Pearl, shown on Figure 2. Bogue Lusa Creek and Coburn Creek flow through the City of Bogalusa and discharge to the Pearl River above Richardson's Landing. At Pool's Bluff a sill or low-head dam has been constructed since 1950 to maintain the pool level and divert flow into the barge canal. At the time of this survey all of the flow was discharging over the dam. The barge canal is seldom used even though it extends from Pool's Bluff to the mouth of Holmes Bayou. The water flowing over Pool's Bluff Sill continues downstream to Wilson's Slough where part of the flow is diverted to the West Pearl and the balance continues past Walkiah Bluff to the head of Holmes Bayou. (During high stream flows part of the river is diverted to the East Pearl.) During the survey there was no flow from the Pearl River across to the East Pearl. Stream flow reaching Holmes Bayou passes on towards the mouth of the Bayou to join the small

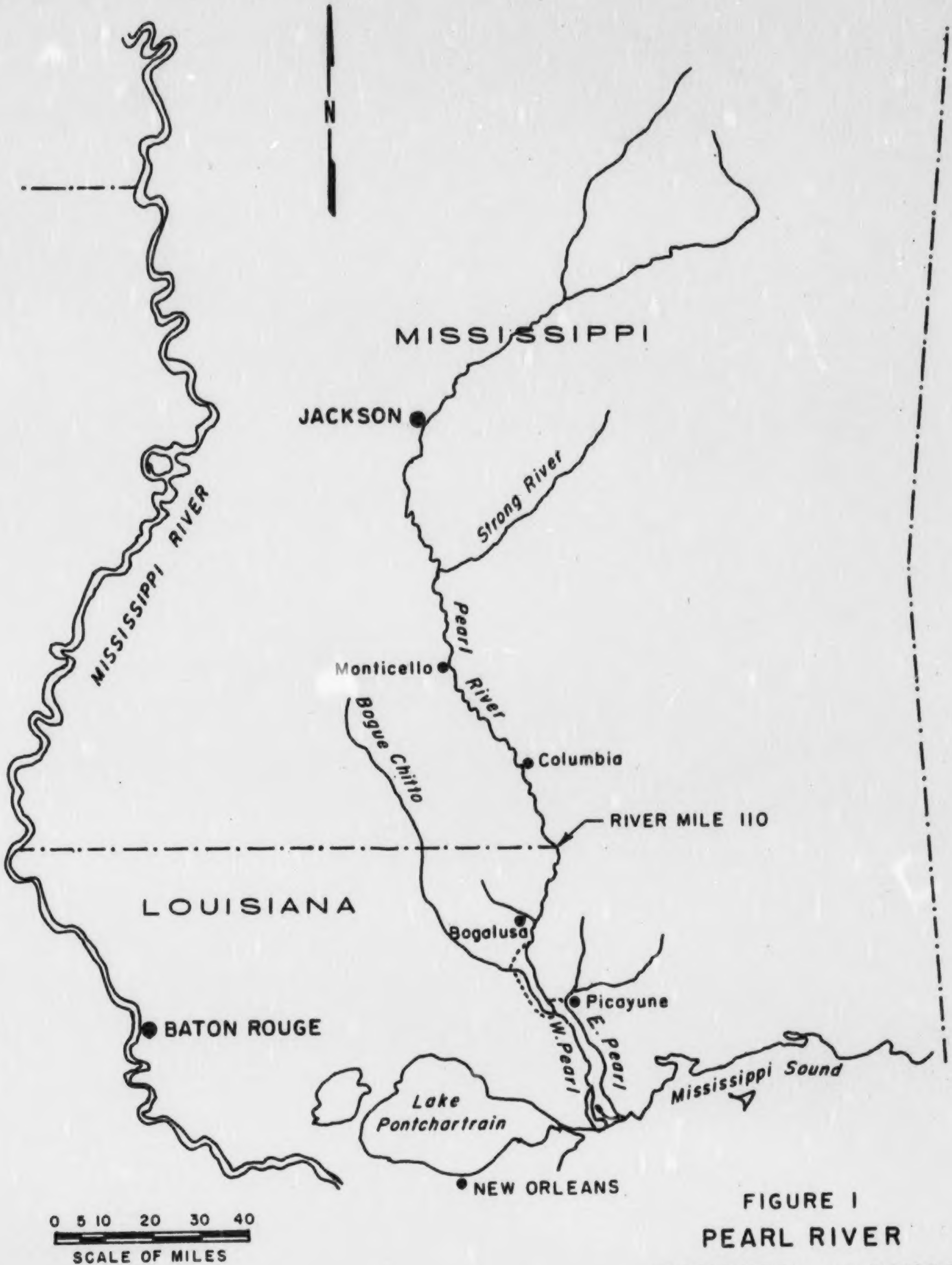
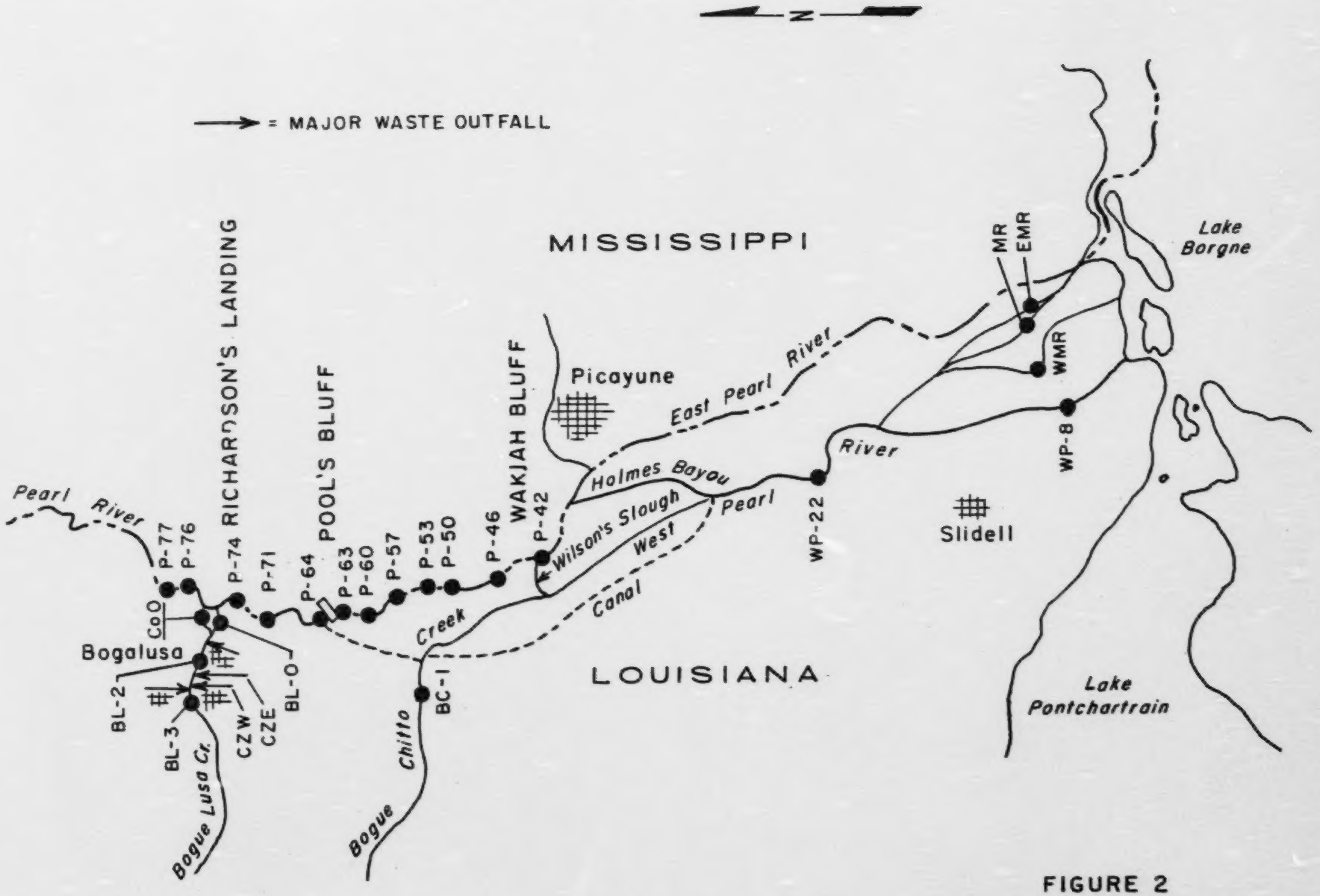

N
MISSISSIPPI
JACKSON
Strong River
MISSISSIPPI RIVER
Pearl River
Monticello
Bogue Chitto
Columbia
RIVER MILE 110
LOUISIANA
Bogalusa
Picayune
BATON ROUGE
W. Pearl
E. Pearl
Mississippi Sound
Lake Pontchartrain
NEW ORLEANS
0 5 10 20 30 40
SCALE OF MILES

FIGURE 1
PEARL RIVER
MISSISSIPPI – LOUISIANA



= MAJOR WASTE OUTFALL
N
MISSISSIPPI
LOUISIANA
Lake Borgne
Lake Pontchartrain
Picayune
Slidell
Bogalusa
Pearl River
East Pearl River
Holmes Bayou
Wilson's Slough
West Pearl River
Canal
Creek
Bogue Chitto
Bogue Lusa Cr.
RICHARDSON'S LANDING
POOL'S BLUFF
WAKJAH BLUFF
P-77
P-76
P-74
P-71
P-64
P-63
P-60
P-57
P-53
P-50
P-46
P-42
CoO
BL-0
BL-2
BL-3
CZW
CZE
BC-1
WP-22
WP-8
WMR
MR
EMR

FIGURE 2

SAMPLING STATIONS
LOWER PEARL RIVER
MISSISSIPPI – LOUISIANA

flow, diverted at Wilson's Slough, at the lower end of the locks and dam of the barge canal. Between Wilson's Slough and the mouth of Holmes Bayou the principal tributary, Bogue Chitto, is introduced from the west. The navigable West Pearl continues to the Rigolets and Little Lake and tidewater.

The interstate waters of the Lower Pearl extend from the Louisiana-Mississippi state line, P-110, to the head of Holmes Bayou, P-40.

In the delta of the Pearl River System there are three rivers between the East Pearl and the West Pearl as shown on Figure 2. These are the East Middle, Middle, and the West Middle Rivers. These rivers are within the tidal effect of the Gulf, and there did not appear to be any appreciable flow in them at the time of the survey.

THE EAST PEARL

The East Pearl River is a separate drainage system lying on the eastern edge of the Pearl River Delta as shown in Figure 3. Prior to 1850, the East Pearl was a distributary of the Pearl River Delta System.[1] About 1850, several man-influenced factors separated this distributary from the main Pearl System.

Two streams, the Hobolochitto and West Hobolochitto, form the upper watershed. The West Hobolochitto joins the Hobolochitto at Picayune, Mississippi (River Mile H-7.5). Farr's Slough joins Hobolochitto Creek 5.2 miles further downstream (H-2.3) and is believed to be the principal

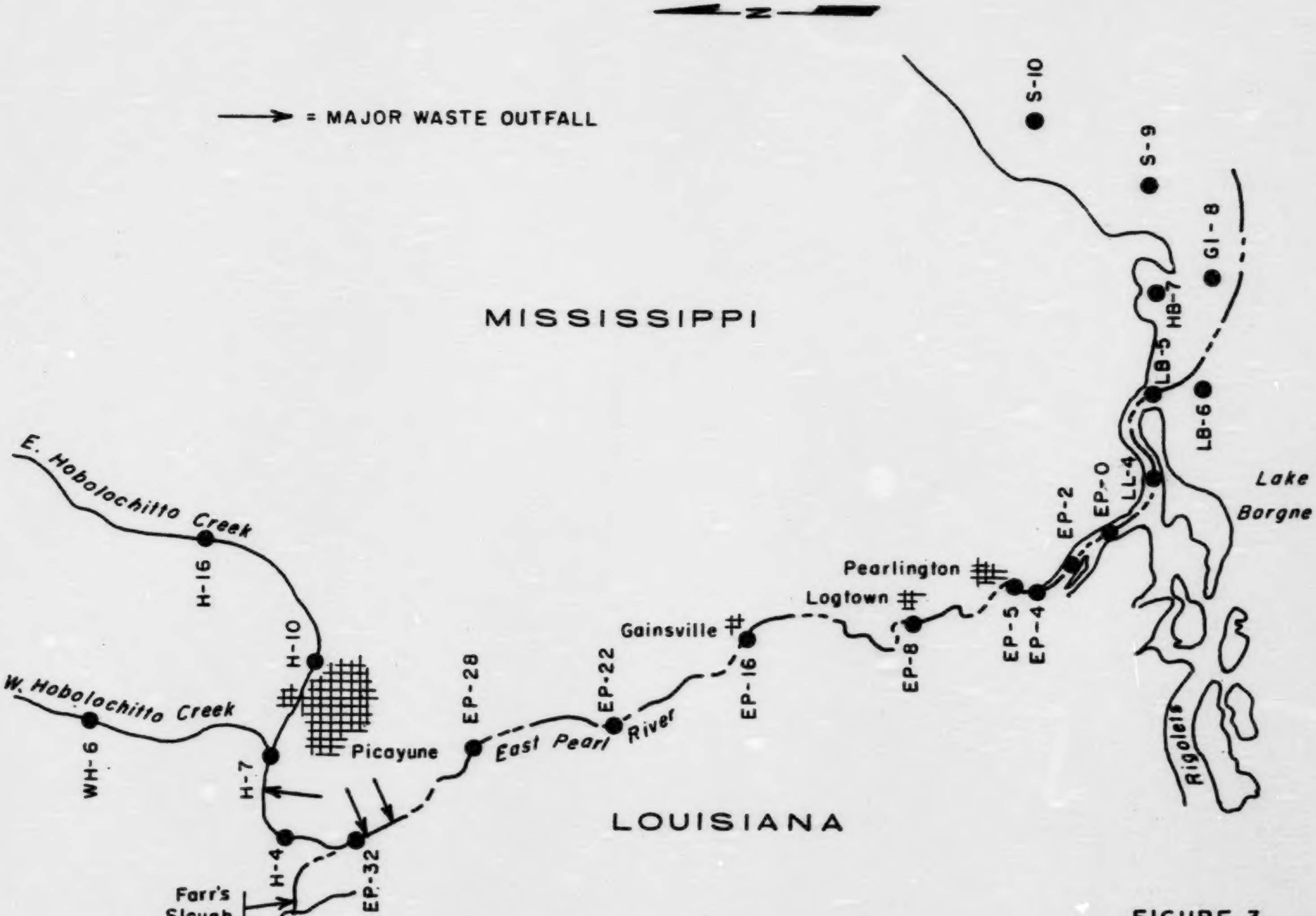

N
→ = MAJOR WASTE OUTFALL
MISSISSIPPI
LOUISIANA
S-10
S-9
GI-8
HB-7
LB-5
LB-6
LL-4
EP-0
EP-2
Lake
Borgne
Rigolets
Pearlington
Logtown
EP-5
EP-4
EP-8
Gainsville
EP-16
EP-22
East Pearl River
EP-28
Picayune
E. Hobolochitto Creek
H-16
H-10
W. Hobolochitto Creek
WH-6
H-7
H-4
EP-32
Farr's
Slough

FIGURE 3
SAMPLING STATIONS
EAST PEARL RIVER
MISSISSIPPI – LOUISIANA

channel carrying high stream flows from the Pearl River to the East Pearl. Hobolochitto Creek becomes the East Pearl River (H-0.0 or EP-33.1) when the river channel joins the State boundary.

The interstate waters of the East Pearl River extend from the mouth of Hobolochitto Creek, H-0.0 or EP-33.1, to tide water, EP-0.0.

SALT WATER

The salt water area considered in this report extends from the Rigolets to Waveland, Mississippi, and includes part of Mississippi Sound, Grass Island, Grand Island, and LePetit Pass Island. Lake Pontchartrain and the Pearl Rivers contribute fresh-water flow to the area.

WATER USES

WATER SUPPLY

The Bogalusa Division of Crown Zellerbach Corporation takes part of its industrial water supply from Bogue Lusa Creek, and Crosby Chemical Corporation takes water from Hobolochitto Creek. The National Aeronautical and Space Administration will be taking cooling water from the East Pearl River for the Mississippi Test Facility in the future.

RECREATION

The Pearl River System is used throughout its length as a fishing stream. Some of the Lower Pearl is a wilderness stream and may be used more extensively as population densities increase and conveniently located boat landings are provided. The area immediately above the Sill is utilized to some extent. Some sport fishermen fish directly in the Pearl River and use the river as a waterway to tributaries and flood plain lakes. Sport fishing activity in the spillway, immediately below the Sill, is popular. Water skiing is primarily confined to the barge canal although the pool immediately above the Sill is utilized as a turning basin while skiing.

STOCK WATERING

Dairy cattle are excluded from the rivers and watered at farm ponds and from wells. Some stock cattle are allowed to graze in the woods of the river bottoms and have access to the stream particularly in the upper reaches where the forest is not so heavy.

NAVIGATION

The salt water area is traversed by the Intercoastal Waterway from the Grand Island Channel through Grand Island past Pearl River Light to the Rigolets. The barge canal on the Pearl River from Holmes Bayou to Pool's Bluff provides a potential navigational use of the stream.

SHELL FISHING

"The oyster-producing areas of the (Mississippi) Sound are primarily located near the previously mentioned islands and the islands forming the southern boundary of the Sound. Due to lack of highways and roads in the area, the Sound is seldom fished by Louisiana oystermen; however, the area is accessible by boat from the Mississippi coast west of Biloxi and, therefore, is used by oystermen from this area. Oysters harvested in the (Louisiana) area by out-of-state fishermen are taxed by the State of Louisiana . . .

"Mississippi Sound west of Biloxi, Mississippi, is open for oyster harvesting during certain periods of the year."[5] The harvest in Louisiana waters was 33,000 barrels in the 1960-1961 season.[4]

SOURCES OF WASTES

MUNICIPAL

The City of Bogalusa (sewered population 21,000) discharges untreated sewage to Bogue Lusa Creek at three different points. Between Cumberland Street and Columbia Street on the north bank a primary sewage treatment plant with separate sludge digestion, and pre- and postchlorination, is under construction. This sewage treatment plant will serve approximately two-thirds of the population. At the time of this survey raw sewage was being discharged to the creek. Sewers for that part of the city, south of Bogue Lusa Creek and east of the railroad tracks, serving the paper mill, discharge to the stream at two points below Columbia Street bridge. At high stream flows part of these wastes reach the Pearl River through Coburn Creek rather than directly through Bogue Lusa Creek.

At Picayune, Mississippi, a sewered population of approximately 430 people, residing north of East Hobolochitto Creek, is served by a sewer system discharging to a waste stabilization pond. Any overflow from this pond discharges to East Hobolochitto Creek upstream from U. S. Highway 11. The balance of the public sewer system, serving approximately 6,000 people, drains to a pumping station in the southwest part of the town which discharges the raw sewage to the East Pearl River, below the mouth of Hobolochitto Creek and west of Nicholson, Mississippi.

Other communities on the banks of the river are not known to have public sewer systems.

INDUSTRIAL WASTES

At Bogalusa, Louisiana, the Crown Zellerbach Corporation operates an integrated kraft sulphate pulp and paper mill. Current production is 825 tons per day of the sulphate pulp, 110 tons per day of neutral sulfite semi-chemical pulp, 115 tons per day of secondary paper pulp, and occasionally up to 160 tons per day of bleached pulp. Waste waters from these operations, with a population equivalent of about 250,000 people, are discharged to Bogue Lusa Creek at two points opposite the new municipal sewage treatment plant. A chemical by-product plant which produces dimethyl sulfide and dimethyl sulfoxide was not operating at the time of the survey.

At Picayune, Mississippi, there are three sources of industrial wastes: Crosby Forest Products, which impregnates lumber products with creosote, and a dairy discharge wastes to the storm sewer canal in the southern part of the town, which drains southwestward beyond the city limits to a natural watercourse or branch, eventually discharging to the East Pearl downstream from the municipal sewage outlet. The third source of industrial waste, Crosby Chemicals, Inc., processes crude tall oil and crude sulphate turpentine, and chemical specialties, some of which contain zinc. The wastes from the tall oil operations discharge to a pond with provisions for skimming. These Crosby Chemical wastes are discharged to Hobolochitto Creek downstream from Beech Road.

PRESENTATION OF DATA

GENERAL

Tabulated chemical and bacteriological data are presented in Appendix A starting with Table A-6, and tabulated biological data are presented in Appendix B. Summarized data are presented in this section of the report in various graphical forms.

Sampling stations occupied during this survey for the collection of chemical and bacteriological data are listed in Table 1. Stations occupied for the collection of biological samples and observations are at these same stations or intermediate points.

A summary of stream flow data is presented in Table 2. Stream flows were reasonably uniform during the period of sampling. The stream flows were well below the average flows for the rivers involved, but exceeded the minimum stream flows of record.

LOWER PEARL RIVER

The principal sources of waste on the Lower Pearl are the pulp and paper mill and the raw municipal sewage at Bogalusa. These waste streams are discharged to Bogue Lusa Creek, which in turn discharges to the Pearl River either directly or through Coburn Creek, depending on the stream flow and the braided channels at the mouths of these two creeks.

PEARL RIVER SURVEY - MISSISSIPPI-LOUISIANA

TABLE NO.1

SAMPLING STATIONS FOR CHEMICAL AND BACTERIOLOGICAL SAMPLES

STATION NUMBER	RIVER MILES	LOCATION	TYPE OF SAMPLE	IMMEDIATE UPSTREAM WASTE
		BOGUE LUSA CREEK (River Mile 74)		
BL3	3.1	Foot bridge upstream from paper mill discharges	Bridge	None
CZW		West sewer, Crown Zellerbach Corp.	Grab	
CZE		East sewer, Crown Zellerbach Corp.	Grab	
BL2	2.5	Columbia St. bridge		Crown Zellerbach & 2/3 City of Bogalusa
BL0	0.1	Mouth of Bogue Lusa Creek	Boat	
		COBURN CREEK (River Mile 75)		
CO0	0.1	Mouth of Coburn Creek	Boat	
		LOWER PEARL RIVER		
P77	77.0	Drawbridge on Louisiana State Hy.10		None
P76	75.5		Boat	None
P74	73.5	Richardson's Landing	Boat	Coburn Creek and Bogue Lusa Creek
P71	70.8		Boat	
P64	63.5	Above Pool's Bluff Sill	Boat	
P63	63.2	Below Pool's Bluff Sill	Boat	
P60	60		Boat	
P57	56.7		Boat	
P53	53.5		Boat	
P50	50.5		Boat	
P49	48.5		Boat	
P46	46.5		Boat	
P42	42.2	Lower Walkiah Bluff	Boat	
WP22	22.0	Old U.S.11 bridge over West Pearl River	Bridge	
WP8	7.8	U.S.90 bridge, 3' below surface of river	Bridge	
BC1		Bridge on Louisiana State Hwy.7 over Bogue Chitto Creek	Bridge	
WMR		U.S.90 bridge over West Middle River	Bridge	
MR		U.S.90 bridge over Middle River	Bridge	
EMR		U.S.90 bridge over East Middle River	Bridge	

PEARL RIVER SURVEY - MISSISSIPPI-LOUISIANA

TABLE NO. 1

SAMPLING STATIONS FOR CHEMICAL AND BACTERIOLOGICAL SAMPLES
(Continued)

STATION NUMBER	RIVER MILES	LOCATION	TYPE OF SAMPLE	IMMEDIATE UPSTREAM WASTE
		HOBOLOCHITTO CREEK (River Mile 33.1)		
H16	15.7	Bridge on road to Union Baptist Church, E. of Caesar, Miss.	Bridge	None
H7	7.1	Beech Road bridge, Picayune, Miss.	Bridge	Virtually none
H4	3.9	Burnt Bridge W. of Picayune, Miss. on Palestine Road	Bridge	Crosby Chemical
		EAST PEARL RIVER		
EP32	32.1	Logging road bridge at Jackson's Landing, W. of Nicholson, Miss.	Bridge	Crosby Chemical
EP28	28.4	New U.S.11 bridge over East Pearl, S. of Nicholson, Miss.	Bridge	City of Picayune and storm water canal
EP22	21.8	Old U.S.11 bridge over East Pearl River, Santa Rosa, Miss.	Bridge	
EP16	16.5	Dock at Pearl River Marina, Gainesville, Miss.		
EP8	8.5	Stream gage, Logtown, Miss.		
EP5	5.0	U.S.90 bridge over East Pearl River	Bridge	
EP4	4.0	Downstream from U.S.90 bridge	Boat	
EP2	2.0	About 3 miles downstream from U.S.90	Boat	
EP0	0.0	Confluence of Old Pearl and East Pearl Rivers	Boat	
LL4		Mouth of Little Lake Pass	Boat	
LB5		Confluence of East Pearl River and Lake Borgne	Boat	
LB6		Near Pearl River Light	Boat	
		MISSISSIPPI SOUND		
HB7		Heron Bay	Boat	
G18		Grand Island Pass, Grassy Is.	Boat	
S9		St. Joseph Pt.	Boat	
S10		Off Bayou Caddy	Boat	

PEARL RIVER SURVEY - MISSISSIPPI-LOUISIANA

TABLE NO. 2

STREAM FLOWS IN CUBIC FEET PER SECOND

Gaging Station	Avg. Daily	Min. of Record	Sept. 11 - 30, 1962		
			Avg.	Min.	Max.
PEARL RIVER					
Jackson, Miss.	3786	78	232	141	364
Monticello, Miss.	6188	289	580	458	839
Columbia, Miss.	7375	705	1099	858	1520
Bogalusa, La.	8909	1100	1947	1700	2310
Pearl River, La.	-	-	2925	2370	3440
BOGUE LUSA CREEK					
Bogalusa, La.	-	-	41	31	88
HOBOLOCHITTO CREEK					
Picayune, Miss. (below)	-	-	70	52	92
EAST PEARL RIVER					
Nicholson, Miss.	-	-	132	120	179

Bogue Lusa and Coburn Creek

The sampling stations occupied on these creeks are shown on Figure 2. For September 10 through 30, 1962, the Bogalusa Division of the Crown Zellerbach Corporation collected, and analyzed, 24-hour composite samples at the Parshall flumes on the east sewer (CZE) and the west sewer (CZW). The flows, B.O.D., and pulp losses (fiber) are reproduced in Table A26 in Appendix A, and are summarized in Table 3 below:

TABLE 3

SUMMARY OF CROWN ZELLERBACH DATA

	Total Flow, MGD	B.O.D. lbs/day	Pulp Losses, lbs./day
Mean	25.8	53,000	45,050
Range*	7.6	46,100	53,700
No. of Samples	21	20	21

* Range is the difference between the largest observed value and the smallest observed value. The standard deviation may be estimated from the range and is a function of the number of samples. For 20 daily composite samples of B.O.D. with a mean value of 53,000 and a range of 46,100, the standard deviation is (0.268) (46,100) = 12,400. If sufficient daily composites are taken in order to include 95% of the probable values, values up to (3) (12400) + 53,000 = 90,200 may be expected.

For the period September 17 to 29, 1962, the U. S. Public Health Service survey party obtained random grab samples from the two sewers once a day and the pulp and paper mill furnished the instantaneous flow data at the time of sampling. These data are summarized in Table 4 below:

TABLE 4

SUMMARY OF PUBLIC HEALTH SERVICE DATA
(Crown Zellerbach Sewers)

	Flow Rate, MGD	B.O.D. Rate, lbs./day
Mean	41.9	41,600
Range	36.0	43,400
No. of Samples	12	12

For the period September 13 to 29, 1962, the B.O.D. being discharged from the mouth of Bogue Lusa Creek (BLO) averaged 34,200 pounds per day.

Biological Investigations

The numerical results for the biological investigations are summarized in Figures 4 and 5. Bottom dwelling animals have been selected to indicate stream bottom conditions because their response to pollution is pronounced; their length of life cycle is sufficiently long, preventing a sudden response to intermittent relief from pollutional conditions; they are incapable of making extended rapid migration, so that the influence of neighboring water conditions is reduced; and they reflect the bottom conditions at a sampling point for an extended period of time. In examining Figures 4 and 5, it should

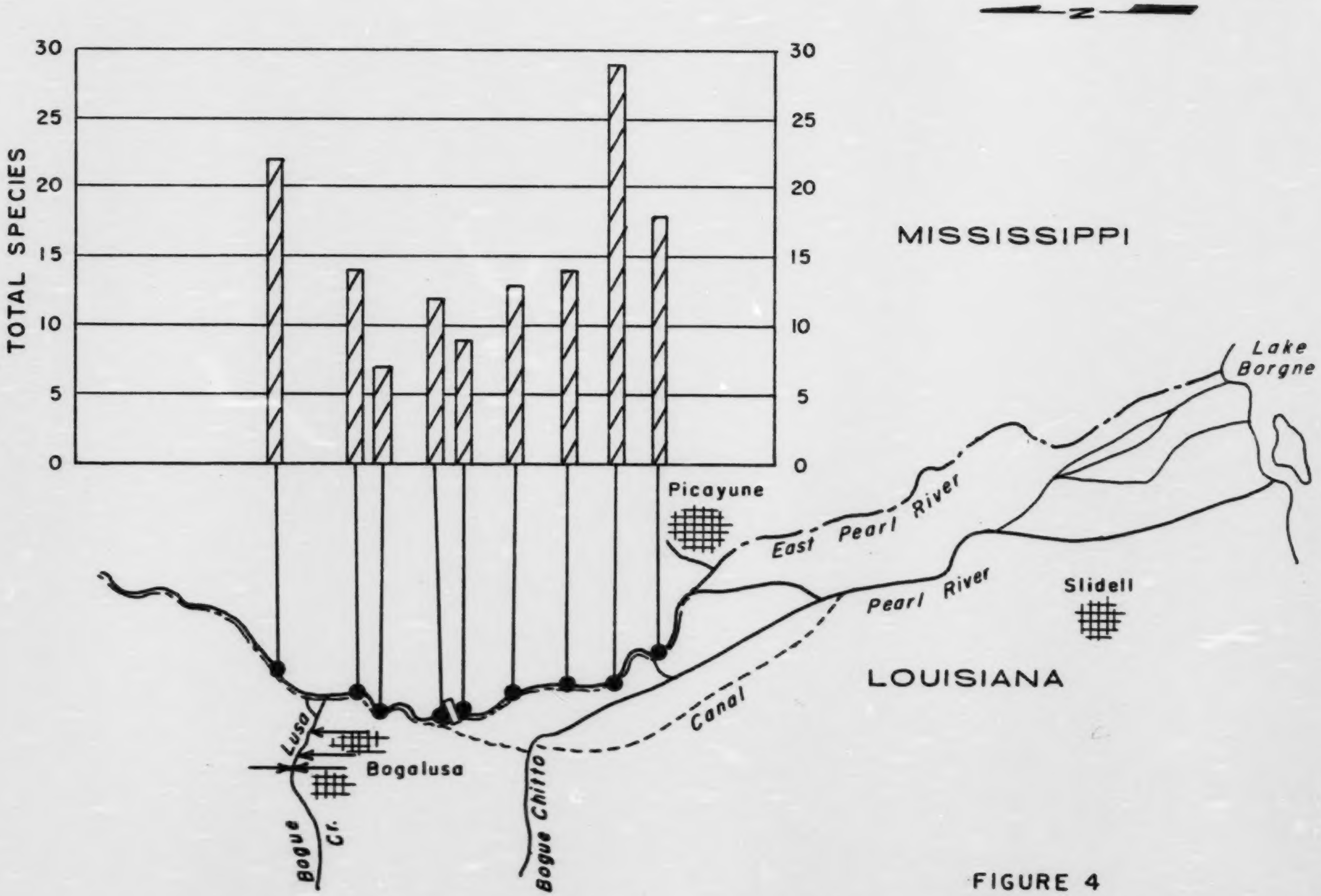


FIGURE 4

SPECIES OF ORGANISMS PER STATION
LOWER PEARL RIVER
MISSISSIPPI – LOUISIANA

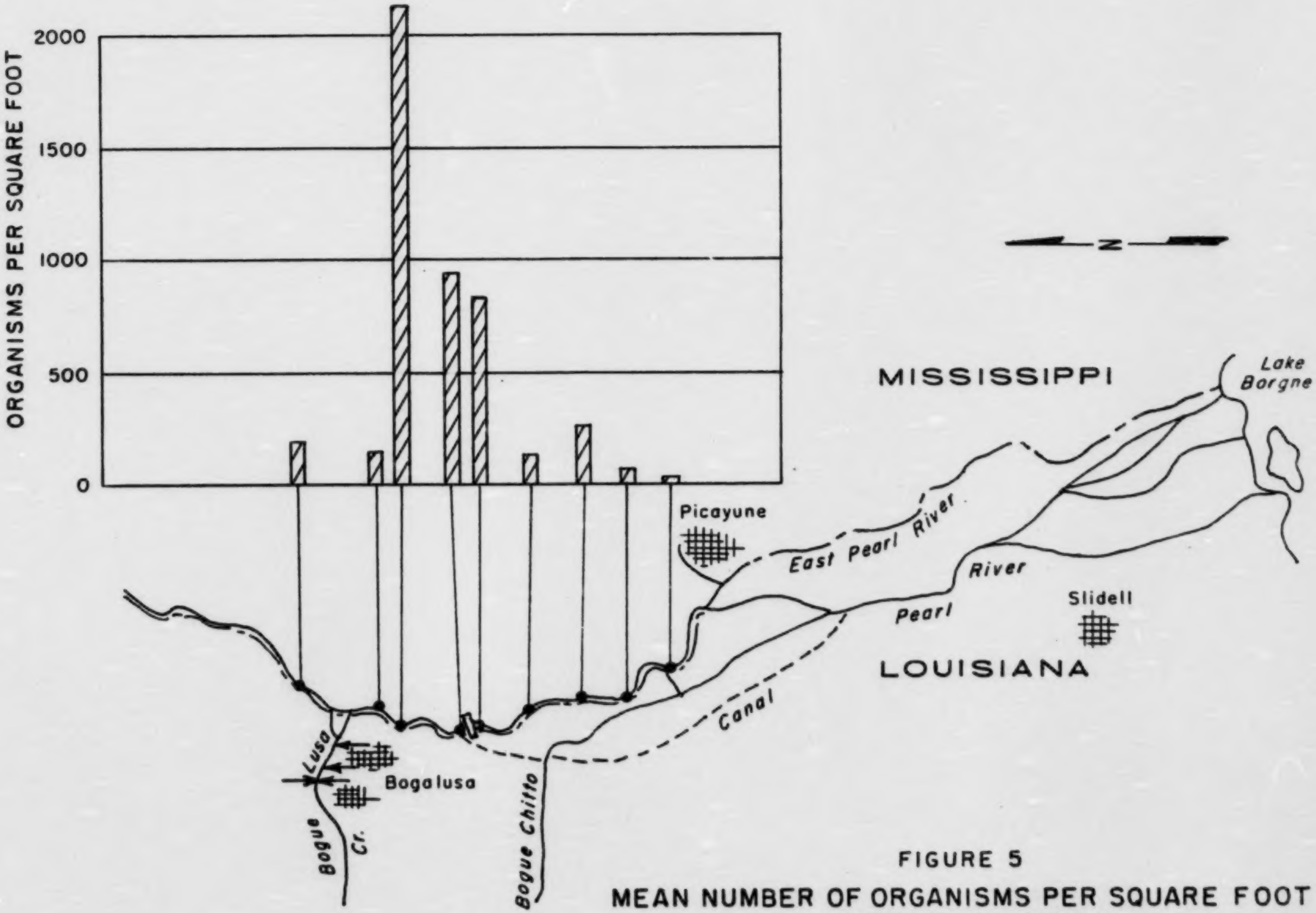


FIGURE 5

MEAN NUMBER OF ORGANISMS PER SQUARE FOOT
LOWER PEARL RIVER
MISSISSIPPI – LOUISIANA

be borne in mind that a relatively small number of bottom-dwelling organisms composing a large variety of species (kinds) is indicative of a clean stream, and conversely, a large population represented by few different kinds is indicative of organic pollution.

Coburn Creek exhibited little flow at the time of sampling. Floating solids were obvious. The bottom was covered by organic material (some digested, some raw wood materials) and bubbling of decomposition gases was obvious. Wood fibers were observed in microscopic exam[illegible]n of collected samples. Only one sludgeworm was found near the mouth [illegible]n Creek indicating conditions to be so severe that tolerant organis[illegible]uld not establish or maintain themselves.

Bogue Lusa Creek had a discharge of about 50 cfs. The water was distinctly colored, odoriferous, and carried a large quantity of suspended wood fiber. Digested sludge was not evident on the bottom; however, freshly deposited wood remains, composed of chips, bark and fibers, were noted. A sludge bank, formed at the mouth, was covered with a matted "fiberboard" where the recently deposited wood fibers had been exposed to dry. No organisms were found in the mouth of Bogue Lusa Creek.

The uppermost station (P-77.3), upstream from the drawbridge for Louisiana State Highway No. 10, is located above the sources of pollution from Bogalusa, Louisiana. At this station a great variety of bottom-dwelling organisms was found (Fig. 4 and Table B1) including forms known to be sensitive to pollutants. (For example: immature mayflies, immature caddisflies, and clams.)

On the Lower Pearl River between the inflows from Coburn and Bogue Lusa Creeks, (P-74) quantitative data (Table B 2) indicate the disappearance of sensitive forms (immature mayflies and caddisflies) in the stream channel. Qualitative data (Table B 1) show two distinct stream zones: The Louisiana bank of the river supported two forms of pollutional-tolerant bloodworm larvae, and the Mississippi bank supported a much more diverse population of bottom organisms (Table B 1) including immature mayflies and caddisflies and clams. This dramatic difference between opposite sides of the stream shows that the majority of the wastes from Coburn Creek were following along the Louisiana bank before becoming mixed with the water of the Pearl River.

At Richardson's Landing (P-74), a short distance below the confluence of Bogue Lusa Creek, large quantities of floating solids were observed on the Pearl. The bubbling of gases indicated the presence of heavy organic loads.

Three miles below the mouth of Bogue Lusa Creek (P-71) the number of sludgeworms was 12 times as great as the upstream control station (P-77), and just above Pool's Bluff Sill (P-64) the number of sludge worms was 5 times as great as that found at the upstream control station. These worms were found in great numbers only where river currents allowed deposition of organic solids. Where velocities were sufficient to keep the solids in suspension, organisms were not found in large quantities on the bottom. For example, a short distance below Pool's Bluff Sill (P-63) a pool along the bank collected organic solids and supported a population of 2,340 worms per square foot; the middle of the stream supported 28 worms per square foot of bottom; the opposite bank, swept clear of organics, supported no worms.

Samples from stations 7 miles (P-57) and 13 miles (P-50) below Pool's Bluff Sill showed signs of beginning recovery; the number of sludgeworms was reduced to a level comparable with the control station (P-77) and the numbers of kinds of bottom organisms were increasing (Table B 1). The sporadic reoccurrence of sensitive forms such as clams and immature mayflies, found at the control station, also indicates the beginning of improvement of water quality.

Seventeen miles (P-46) below Pool's Bluff Sill the community of bottom organism was indicative of stream recovery. The kinds of bottom organisms were diverse and tolerant organisms were no longer the predominant type in the community structure. The general low production of organisms just below lower Walkiah Bluff (P-42) is a result of physical environment; the river is shallower and more channelized resulting in swifter currents that shift bottom sands and gravels.

The navigation canal that is diverted from the Pearl River at Pool's Bluff Sill exhibited a clean water group of organisms a short distance down the canal from the Sill. This water exhibited no flow; thus, the pollutional load did not appreciably affect the canal, but instead was carried by the main river. The navigational canal produced specimens of large clams. These clams were strikingly absent in the degraded water reaches of the Lower Pearl River. Specimens of clams reappeared sporadically in the downstream recovery zone.

Coliform Bacteria

Coliform bacteria were determined as an indicator of probable presence of pathogenic or disease-bearing bacteria and viruses and recorded as coliform density in terms of most probable number (MPN) per 100 ml. A more specific indicator of bacteriological pollution involves bacteria specifically of fecal origin and is expressed in terms of MPN of fecal coliform per 100 ml. In the tables in Appendix A this is tabulated as E. Coli. For water contact sports it is generally accepted by public health authorities that the coliform density should not exceed 1,000 MPN/100 ml and for general recreational use and surface water supplies where water treatment plants are in use, it is generally accepted by the same authorities that the coliform density should not exceed 5,000 MPN/100 ml. These data are summarized in Figure 6.

For both of the control stations (P77 and P76) above the mouth of Bogue Lusa Creek the average coliform density was in excess of that recommended for water contact sports, At the drawbridge on Louisiana State Highway 10 (P77) the average coliform density of 3255 MPN/100 ml was satisfactory for general recreational use, however the other control station about a mile and a half down stream with an MPN/100 ml of 7983 was unsatisfactory for general recreational use. The coliform organisms discharged from the two creeks showed some expected growth in the river (to a value of 167,600 MPN/100 ml) and die off, but the coliform density was not low enough in any of the samples collected from Bogue Lusa Creek to Walkiah Bluff to be satisfactory for recreational use. In the accessible part of the interstate waters from below the creeks to Walkiah Bluff the

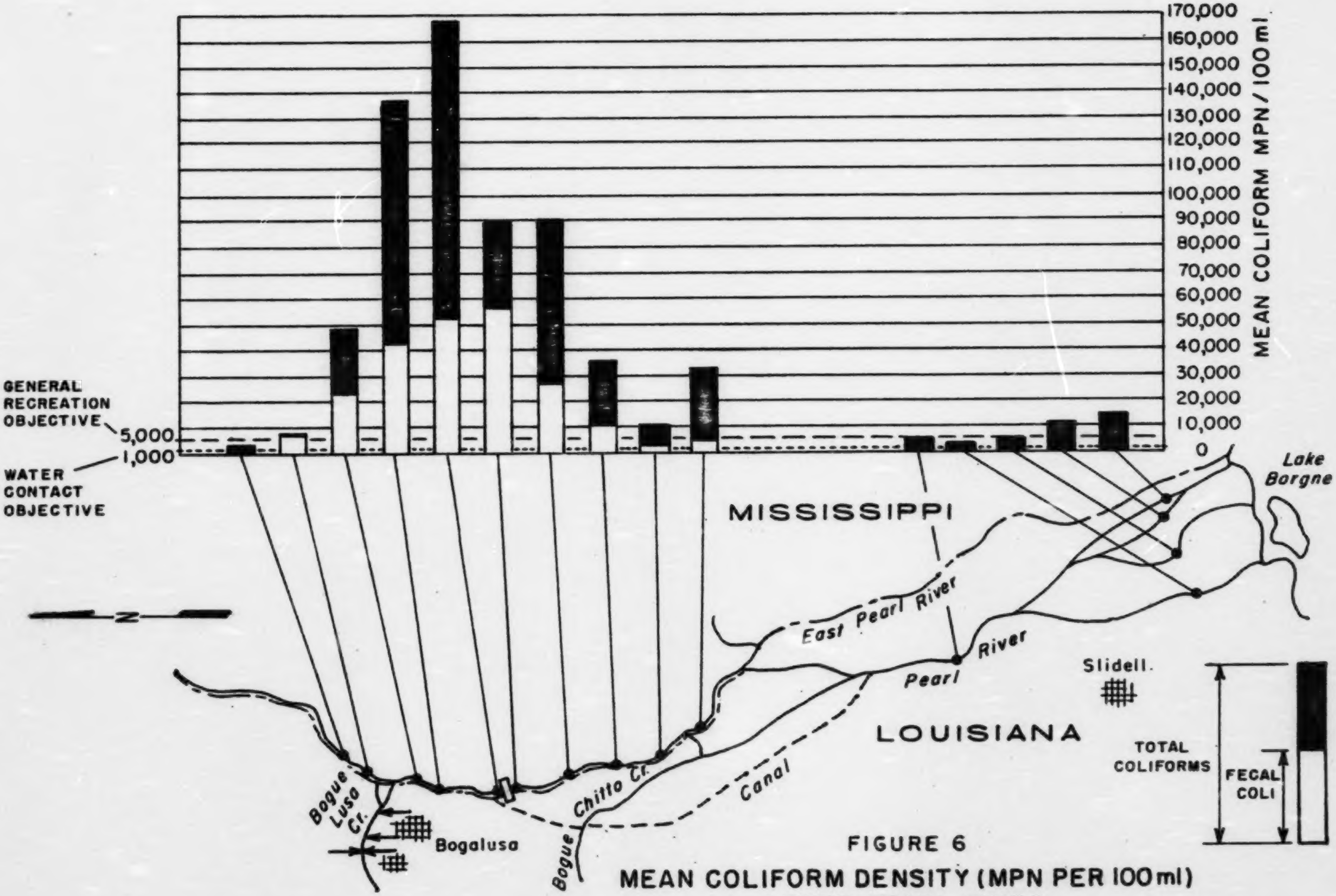


FIGURE 6

MEAN COLIFORM DENSITY (MPN PER 100 ml)

LOWER PEARL RIVER

MISSISSIPPI – LOUISIANA

stream is so heavily polluted that it is unfit for water contact sports.

The Bogue Chitto did not carry any great amount of pollution during the period of the survey.

Biochemical Oxygen Demand

The concentration or amount of organic pollutional material being discharged in the stream or measured in the stream is expressed as 5-day B.O.D. (biochemical oxygen demand) and is generally referred to simply as B.O.D. in this report. The observed concentration of B.O.D. in the Lower Pearl River during the period of the survey is summarized in Figure 7. The average concentration of B.O.D. at the individual sampling stations is shown as a heavy bar on the figure, and the maximum value for a single sample is shown as an unshaded bar. At the control stations on the Pearl River above the mouth of Bogue Lusa Creek the average concentration of B.O.D. was 1.9 and 1.8 mg/l for the two stations. Approximately four miles downstream from the discharges from Bogue Lusa and Coburn Creeks (P71), the average concentration of B.O.D. was 5.7 mg/l. From this location to Lower Walkiah Bluff (P42) the concentration gradually diminished to a value of 3 mg/l. Farther down stream at old U.S. Highway 11 and U.S. 90 the concentration of B.O.D. had been further reduced to 1.8 mg/l. B.O.D. data will be evaluated again but in a slightly different manner further on in this report when the oxygen sag curve is discussed.

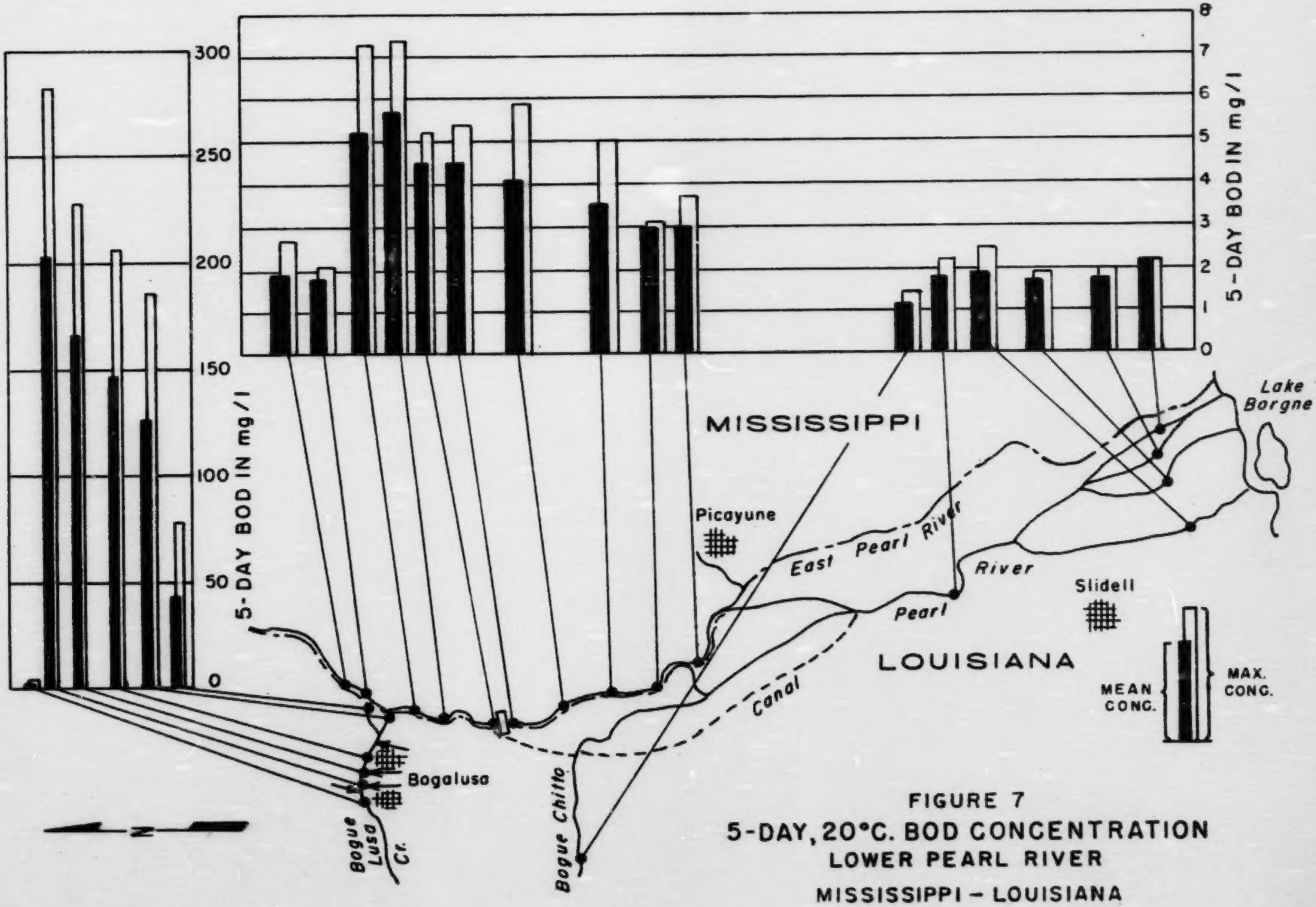


FIGURE 7
5-DAY, 20°C. BOD CONCENTRATION
LOWER PEARL RIVER
MISSISSIPPI – LOUISIANA

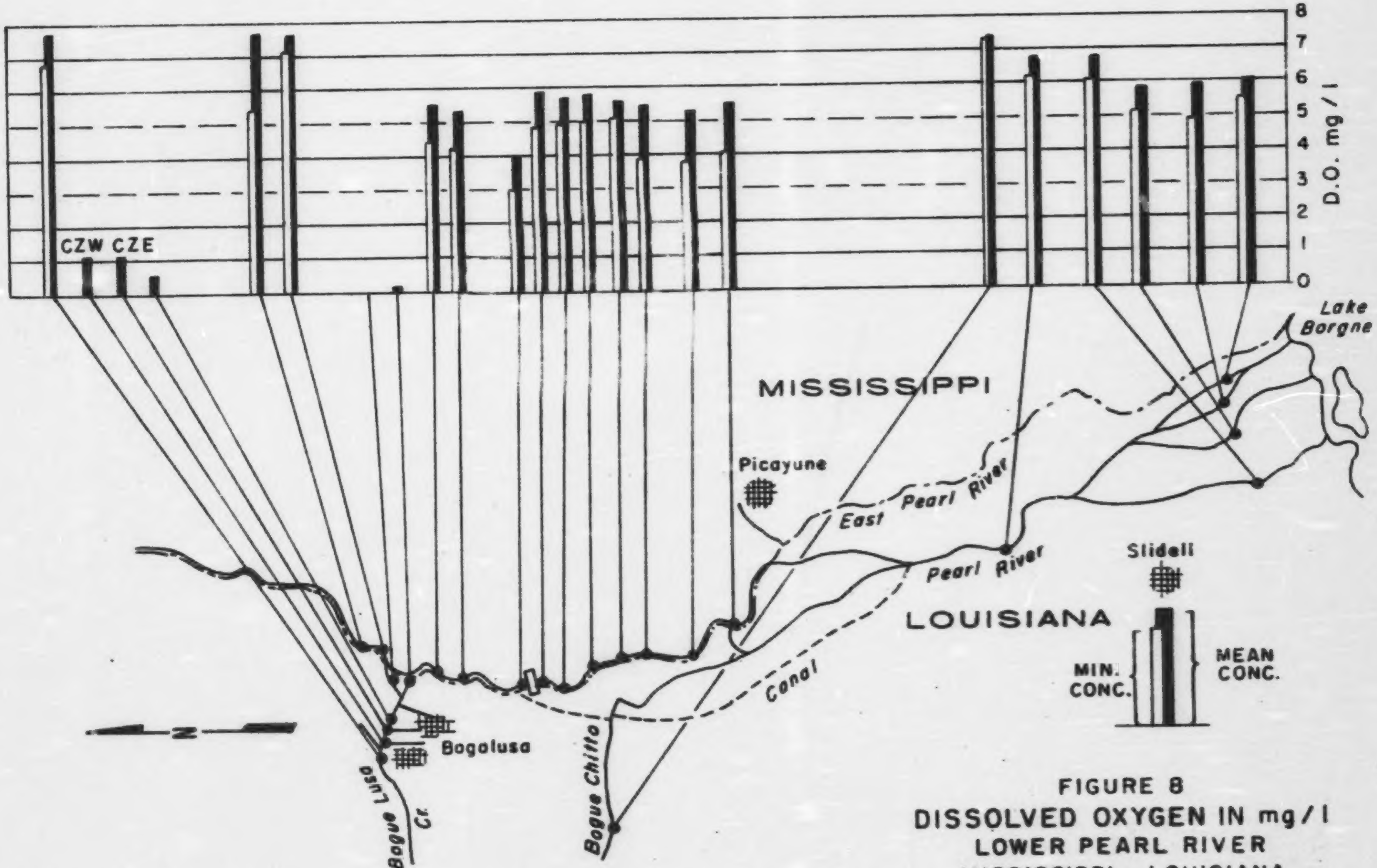


FIGURE 8
DISSOLVED OXYGEN IN mg/l
LOWER PEARL RIVER
MISSISSIPPI — LOUISIANA

Returning to above Pool's Bluff Sill it may be noted that the average D.O. was 4 mg/l with a minimum value of 3 mg/l during the period of the survey. Immediately below this sill the average value was 5.9 mg/l and the minimum value was 4.9 mg/l. This increase in dissolved oxygen is due to the reaeration of the stream caused by the water spilling over the low head dam that constitutes the Sill. As long as all of the flow of the stream goes over this sill, the Sill is of considerable benefit to the stream.

Oxygen Sag Curve

Figure 9 shows the probability of drought flows for the Pearl River at Bogalusa, Louisiana, gage. An annual low flow of 1500 cfs (cubic feet per second) for one day can be expected. During the survey the flows were on the order of 2,000 cfs. Once in 10 years an average discharge of 1,100 cfs for a period of 7 days can be expected. Oxygenation constants and stream reaeration constants for the oxygen sag curve observed during the period of this survey were calculated on an electronic analog computer, as detailed in Appendix C. Using these constants, dissolved oxygen concentrations for other stream conditions were calculated on the analog computer. The results of some of these computations are shown on Fig. 10.

The immediate oxygen demand on the Pearl River caused by the anaerobic conditions in Bogue Lusa Creek and the oxygen demand from the deposited fibers in the vicinity of Richardson's Landing exerted a heavy demand on the oxygen assets of the stream. For the B.O.D. load observed

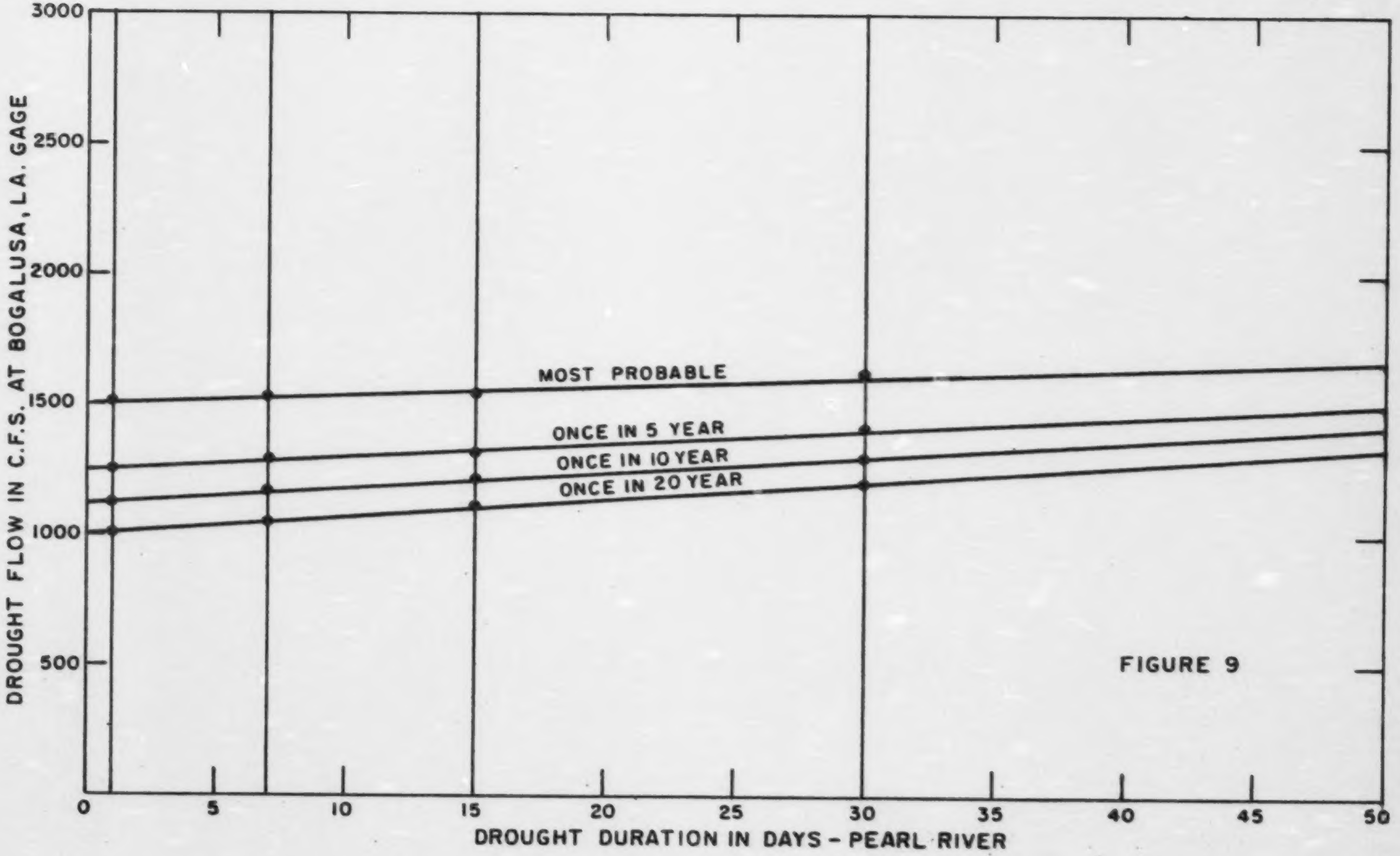

3000
2500
2000
1500
1000
500
DROUGHT FLOW IN C.F.S. AT BOGALUSA, LA. GAGE
0
5
10
15
20
25
30
35
40
45
50
DROUGHT DURATION IN DAYS - PEARL RIVER
MOST PROBABLE
ONCE IN 5 YEAR
ONCE IN 10 YEAR
ONCE IN 20 YEAR

FIGURE 9

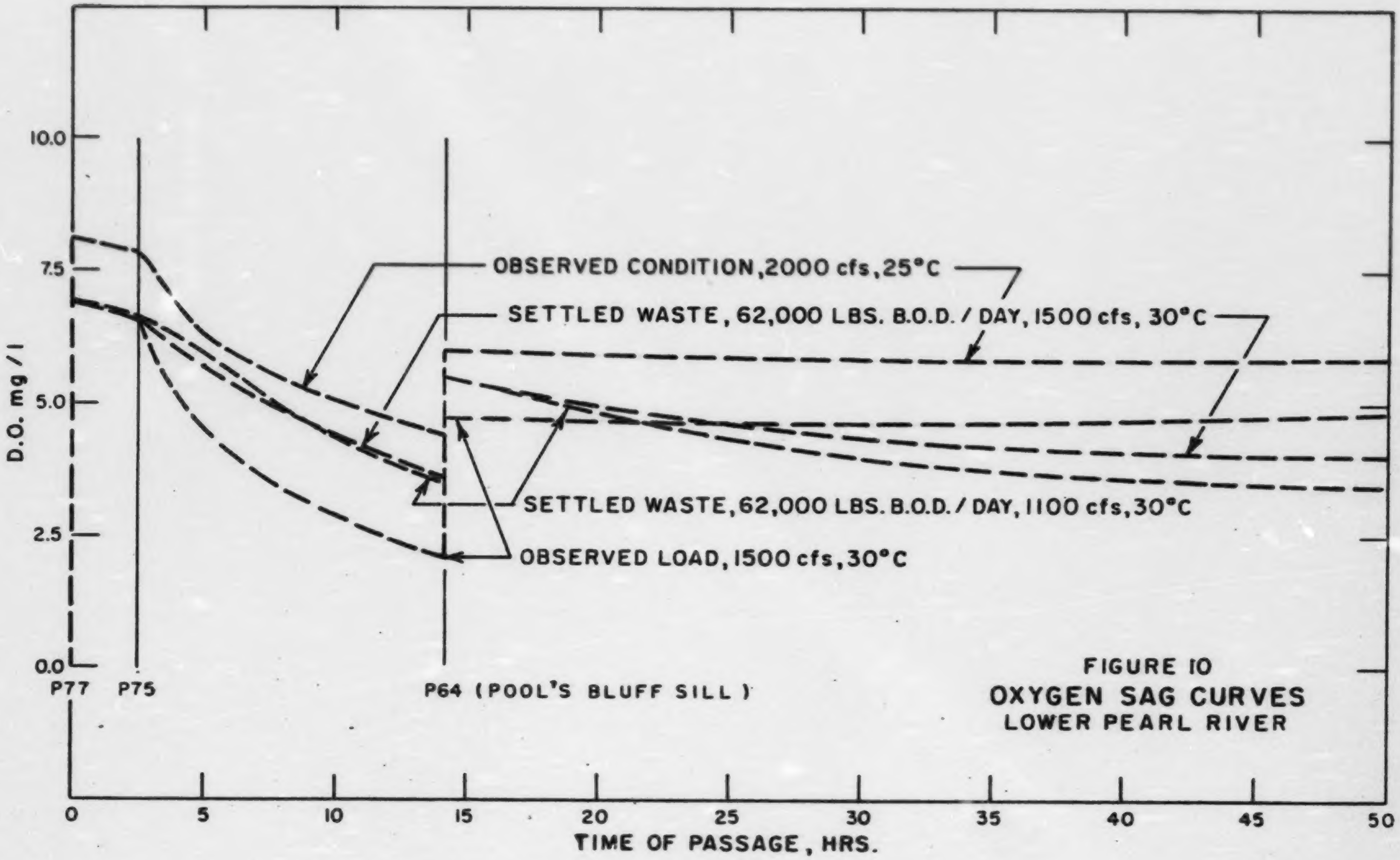


FIGURE 10
OXYGEN SAG CURVES
LOWER PEARL RIVER

during this survey but at flows of 1,500 cfs and water temperature conditions of 30°C (86°F) it is estimated that the oxygen concentration would be less than 3 mg/l above Pool's Bluff Sill. At flows of 1,100 cfs and temperatures of 25°C, about the same undesirable conditions are estimated.

The proposed treatment of the pulp and paper mill wastes by primary sedimentation should alleviate the conditions caused by the fibers settling in the streams. It was assumed that primary sedimentation would be accompanied by an increase in waste discharge from the pulp and paper mill to 62,000 pounds per day of B.O.D.[3] At 2,000 cfs, this would result in a D.O. of 5.6 mg/l above Pool's Bluff Sill, 5.5 at the sag point down stream, at 25°C; for 30°C the D.O. would be 4.2 and 4.7 respectively. For a stream flow of 1,500 cfs at 30°C the D.O. would be 3.6 mg/l above the Sill and 4.2 at the downstream sag point. For 25°C and 1,100 cfs the values would be 4.8 and 4.0. These are to be compared to an objective of 5.0 mg/l D.O.

1963 Data

Following unusually low winter runoff in the Pearl River valley, the Louisiana Stream Control Commission collected the following information on the Lower Pearl:

Date	Flow cfs	Temp. °C	Dissolved Oxygen, mg/l Pool's Bluff	Dissolved Oxygen, mg/l Above Bogue Lusa
June 13	1035	31.5	1.0	
14	1025	31	1.6	
15	1020	31	1.8	
16	1000	30.5	2.0	
17	990	30.5	1.8	6.2
18	985	29	1.6	6.0
19	980	28.5	1.8	6.9
20	980	27.5	3.2	7.2
23	1060	27	1.2	
24	1066	28	0.8	
25	1145	28	1.0	
26	1196	28.5	1.6	
27	1495	29	4.8	
28	1877	27.5	4.0	6.6
29	1532	29.5	4.6	8.4
30	1125	29	5.2	8.6

Computations made on the analog computer had indicated that for waste loads observed during the survey but for stream flows of 1,100 cfs and 30°C the D.O. above Pool's Bluff Sill would be 1.1 mg/l if the D.O. at P-77 was 7.0 mg/l. The 1963 data are a very satisfactory confirmation of the computations.

These 1963 data are noteworthy because of the simultaneous occurrence of low stream flows on the order of 1,000 cfs and temperatures of 30°C. This event is quite unexpected.

EAST PEARL RIVER

The general location of sampling stations established on the East Pearl River and its tributaries during this survey are indicated on Figure 3.

Biological Investigations

Biological samples were collected on the East Pearl in a manner similar to that on the Lower Pearl. A summary of the biological data is presented in Figures 11 and 12.

A collection 6 miles above the mouth of West Hobolochitto Creek produced a clean water group of organisms.

Biological samples collected from the upstream control station on East Hobolochitto Creek (H16) about 8 miles above Picayune, Mississippi, possessed a diverse population of bottom organisms indicative of good water quality. Above U.S.Highway 11 bridge samples revealed a degraded population of bottom organisms compared to the upstream station. A quantitative reduction in total population was noted and some bottom organisms such as immature stoneflies, hellgrammites, clams, and one species of immature caddisfly were not found at this station. A small number of intolerant organisms (immature caddisflies and mayflies) observed in the qualitative sampling may have been caused by bottom organism repopulation, or drifting organisms that had not yet succumbed to existing conditions. The cause of this reduction in bottom animal population may have been an accidental or periodic discharge of a pollutant from an unknown upstream source. At Burnt Bridge (H4), below the discharge from Crosby Chemicals, Inc.,

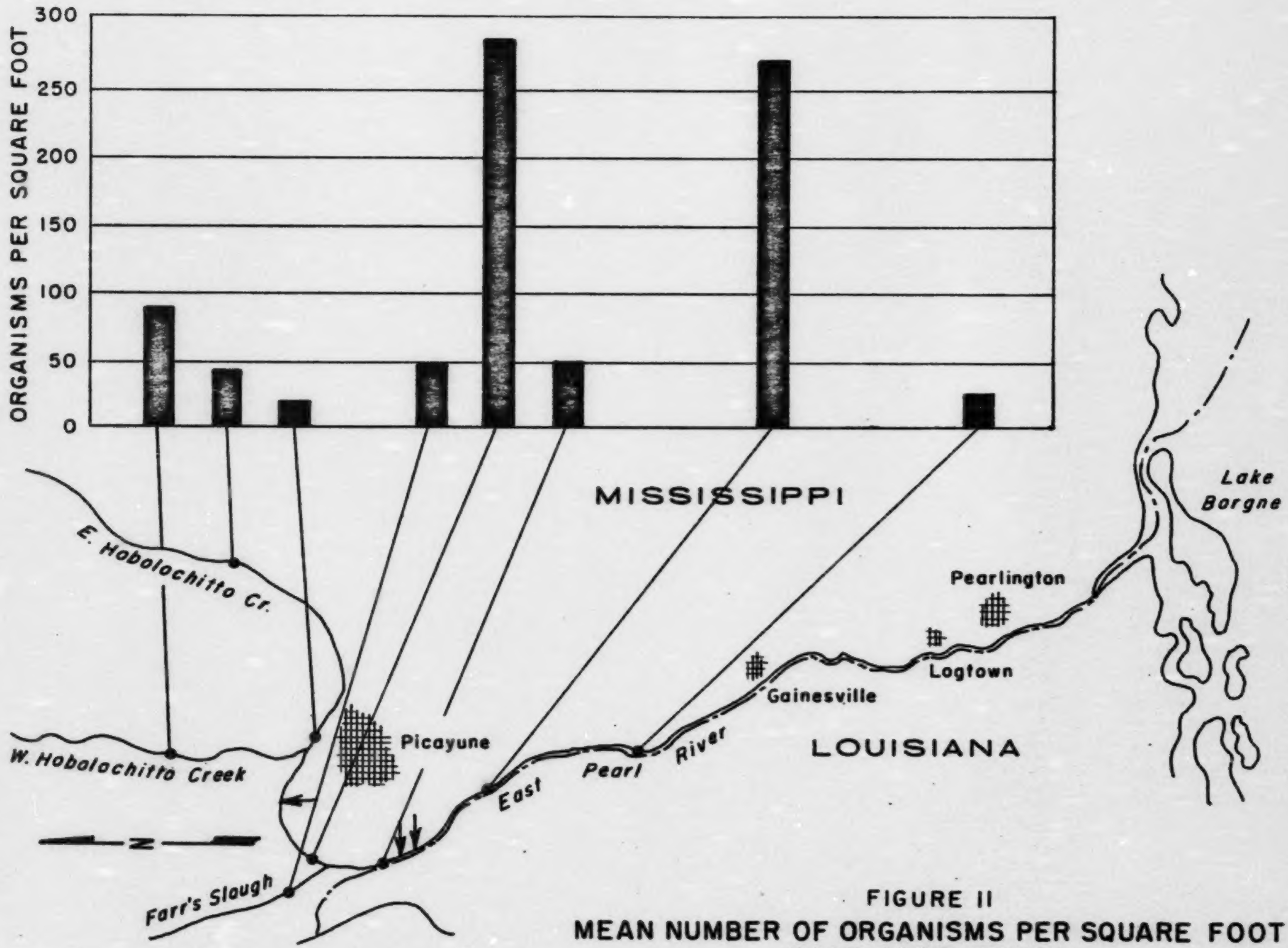


FIGURE II
MEAN NUMBER OF ORGANISMS PER SQUARE FOOT
EAST PEARL RIVER
MISSISSIPPI – LOUISIANA

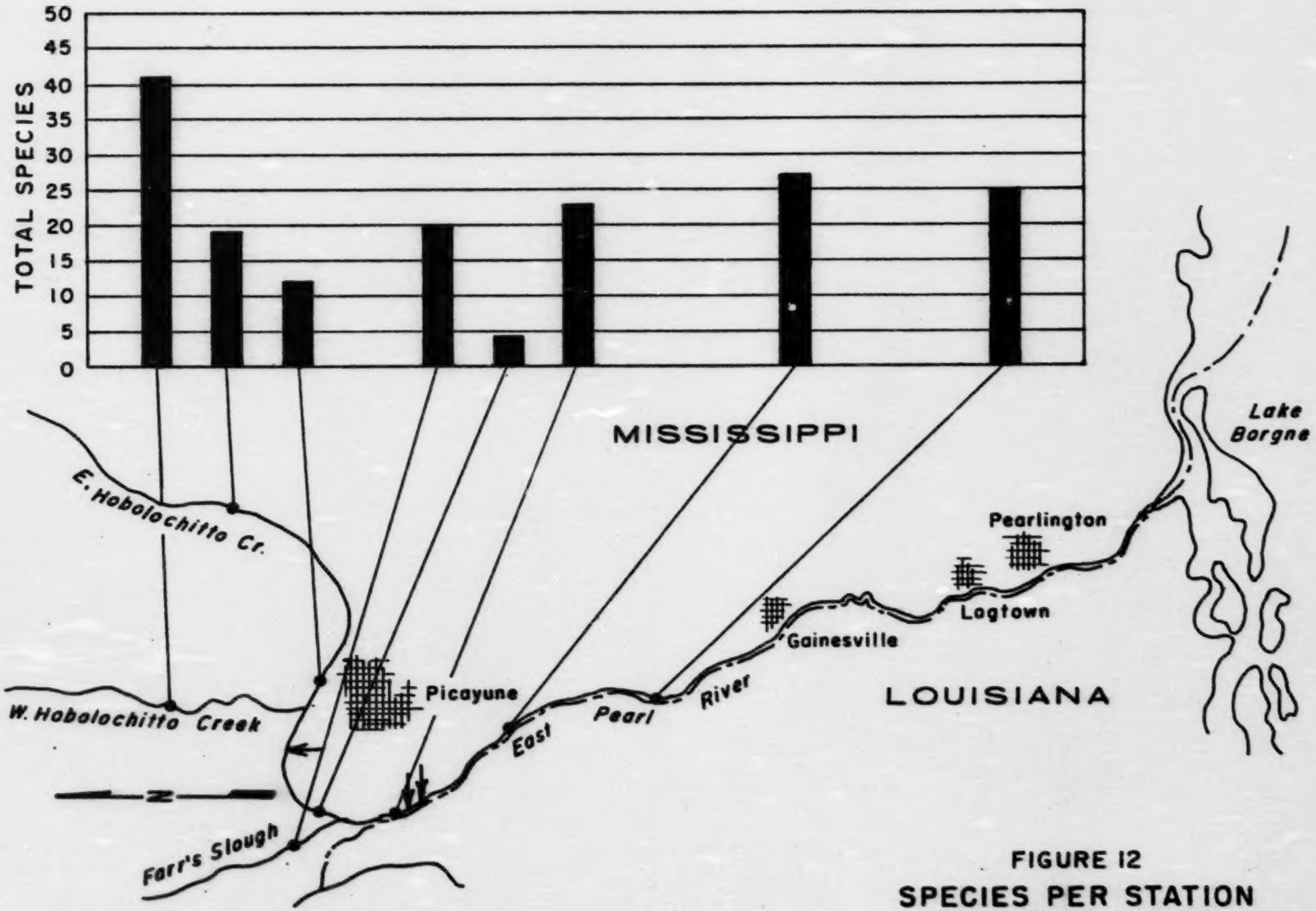


FIGURE 12
SPECIES PER STATION
EAST PEARL RIVER
MISSISSIPPI – LOUISIANA

biological samples showed distinct effects from pollution on the stream bottom. The reduction in the variety of organisms, the increase in numbers of tolerant forms (sludgeworms and bloodworms), and the absence of sensitive forms (immature mayflies, caddisflies, etc.) indicated a degradation of this area. In addition, bacterial slimes were obvious on higher aquatic plants and other supporting objects. Heavy algal blankets covered sand bars and the bottom of pools.

Qualitative sampling in Farr's Slough demonstrated the presence of clean water associated organisms. The supporting objects on the bottom of the stream in Hobolochitto Creek were covered with an algal blanket that supported many bloodworms, while this blue-green algal blanket was lacking in Farr's Slough (confluence stream). The addition of water from Farr's Slough had much to do with the recovery of downstream stretches of Hobolochitto Creek.

Biological samples collected at the first station in interstate waters at Jackson's Landing (EP-32) showed partial stream recovery. Bottom dwelling organisms were more diverse (Figure 12) than at the upstream station (H-4). The quantity of bloodworms and sludgeworms was also reduced at Jackson's Landing. Biological samples collected in the reach from Jackson's Landing to Pearlington, Mississippi, indicated that stream bottom organisms were not affected by pollution.

Coliform Bacteria

The summary data of mean coliform concentration of the East Pearl River during the survey is presented in Figure 13. At the clean water control station (H16) on East Hobolochitto Creek the density of coliform bacteria was in excess of 5,000 MPN/100 ml with an average value of 8,740, the density of fecal coliform however was 306 MPN/100 ml. This was the only sign of pollution at this control station. Bacteriological samples were collected from the water intake impoundment for Crosby Chemicals, Inc., just below the Beech Street bridge (H7). The average coliform concentration was 5,938 MPN/100 ml with a single extreme value of 54,200, while the average fecal coliform density was 3,363 MPN/100 ml. Other than this coliform pollution the station appeared to be a clean stream station and suitable control for Hobolochitto Creek, which was receiving discharges from Crosby Chemicals, Inc., just downstream. At Burnt Bridge, (H4), below the discharge from Crosby Chemicals, Inc., the coliform density was 8,705 MPN/100 ml on the average. In interstate water at new U.S. 11 bridge (EP-28) below the sewage discharge from the city of Picayune the density of coliform organisms increased to 120,750 and the density of fecal organisms was 25,175 MPN/100 ml. At old U.S. 11 bridge (EP-22) the average density of coliform organisms had been sharply reduced to 18,229 MPN/100 ml with average density of fecal organisms of 2,319. At Gainesville, Miss. (EP-16) the coliform density was reduced to below 5,000 having a value of 4,495. The coliform density increased slightly to an average of 7,550 at Logtown and then dropped back to an average value of 4,050 at U.S. 90 bridge (EP-5).

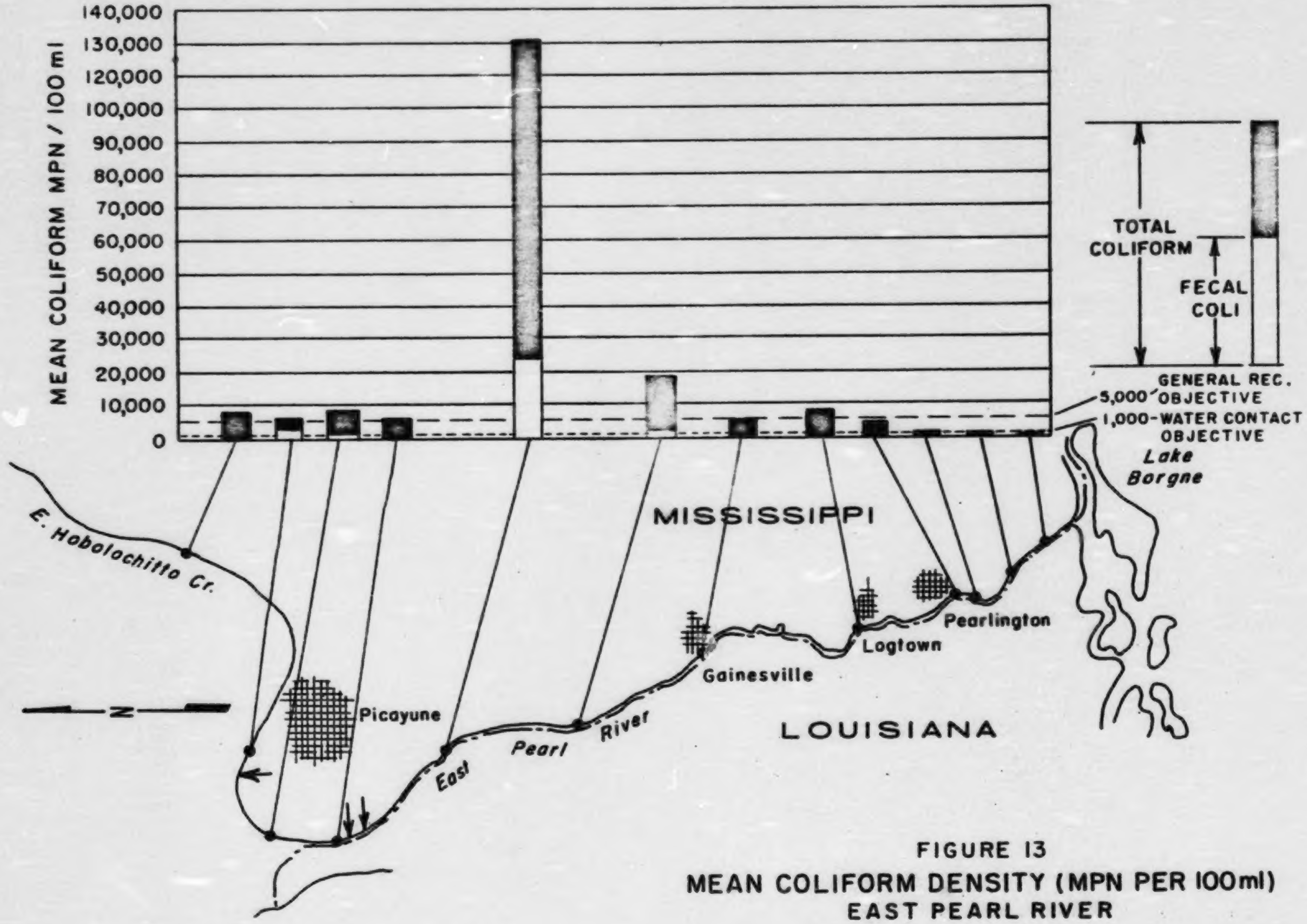


FIGURE 13
MEAN COLIFORM DENSITY (MPN PER 100ml)
EAST PEARL RIVER
MISSISSIPPI – LOUISIANA

Samples were collected and analyzed by the Mississippi State Board of Health from Pearlington (EP-4) on the East Pearl River downstream and out into the Mississippi Sound. These data are summarized in Figure 14. From Pearlington to the confluence of the East Pearl River and Lake Borgne (LB-5) the coliform index showed a continuing reduction in such bacteria. For five stations in the Sound, during the period of this survey, the MPN/100 ml was less than the maximum concentration recommended for areas approved by U. S. Public Health Service for direct harvesting of shellfish. These data compare well with those reported by Louisiana State Board of Health[4] for August and September, 1962.

Biochemical Oxygen Demand

The concentration of B.O.D. data for the East Pearl River are summarized in Figure 15. The clean water control station (H-16) on East Hobolochitto Creek had an average of B.O.D. concentration of 1.0 mg/l which is the normal background for an unpolluted stream. The sample collected at Beech Rd. bridge (H-7) also showed a clean stream condition as far as B.O.D. was concerned. At Burnt Bridge (H-4), below the discharge from Crosby Chemicals, Inc., the organic pollution expressed as B.O.D. had increased four fold from that at Beech Rd. indicating a source of pollution which was confirmed by the biological samples. Chemical samples collected at Jackson's Landing (EP-32) showed a reduction in B.O.D. and some stream recovery. The chemical sample collected at new U.S. 11 bridge (EP-28) below the discharge from Picayune, Mississippi, showed a slight increase of B.O.D. to an average value of 4.1 mg/l. From here on down stream

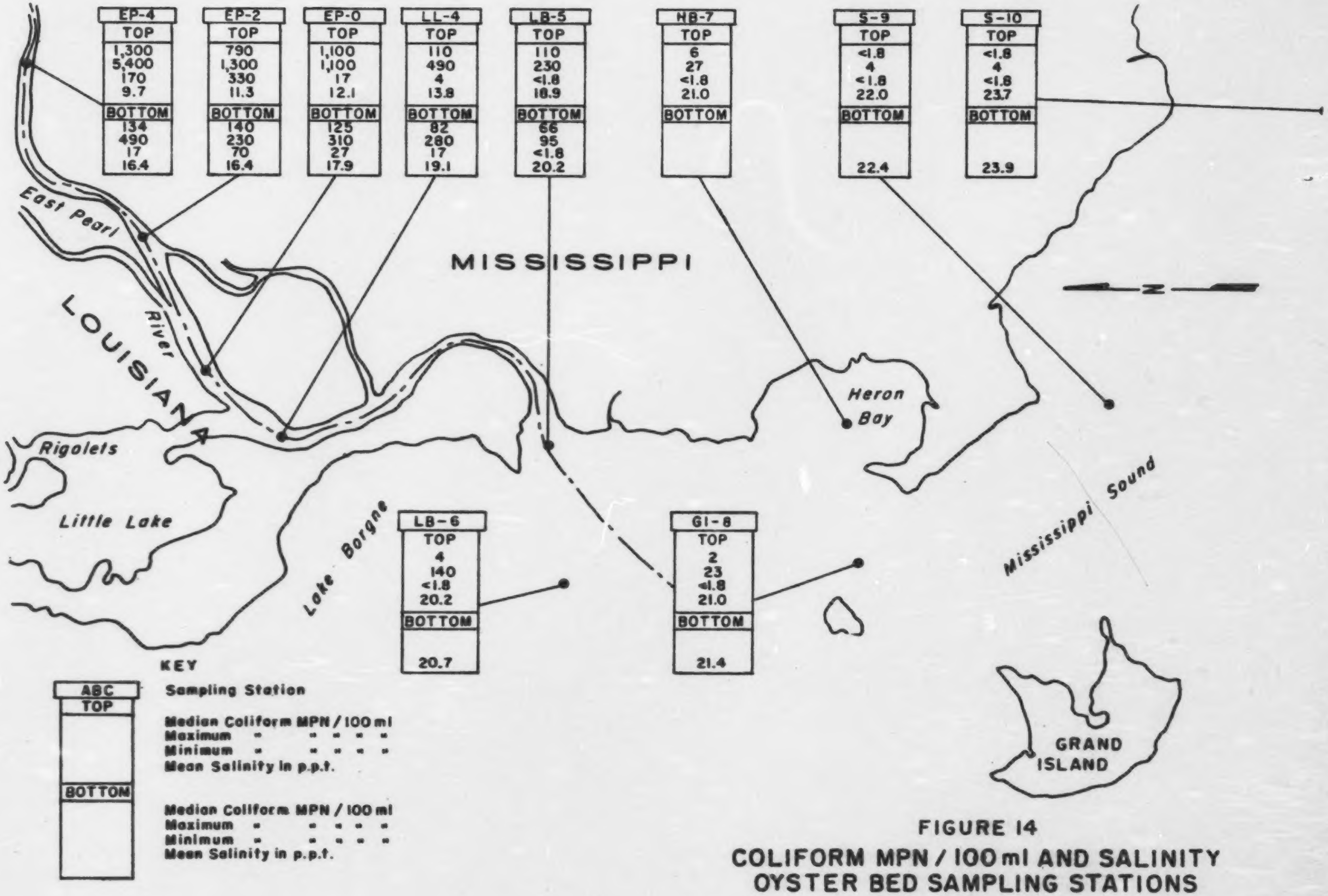

EP-4
TOP
1,300
5,400
170
9.7
BOTTOM
134
490
17
16.4
EP-2
TOP
790
1,300
330
11.3
BOTTOM
140
230
70
16.4
EP-0
TOP
1,100
1,100
17
12.1
BOTTOM
125
310
27
17.9
LL-4
TOP
110
490
4
13.8
BOTTOM
82
280
17
19.1
LB-5
TOP
110
230
<1.8
18.9
BOTTOM
66
95
<1.8
20.2
HB-7
TOP
6
27
<1.8
21.0
BOTTOM
S-9
TOP
<1.8
4
<1.8
22.0
BOTTOM
22.4
S-10
TOP
<1.8
4
<1.8
23.7
BOTTOM
23.9
N
MISSISSIPPI
East Pearl
River
LOUISIANA
Rigolets
Little Lake
Lake Borgne
Heron Bay
Mississippi Sound
GRAND ISLAND
LB-6
TOP
4
140
<1.8
20.2
BOTTOM
20.7
GI-8
TOP
2
23
<1.8
21.0
BOTTOM
21.4
KEY
ABC
TOP
BOTTOM
Sampling Station
Median Coliform MPN / 100 ml
Maximum " " " " "
Minimum " " " " "
Mean Salinity in p.p.t.
Median Coliform MPN / 100 ml
Maximum " " " " "
Minimum " " " " "
Mean Salinity in p.p.t.

FIGURE 14

COLIFORM MPN / 100 ml AND SALINITY
OYSTER BED SAMPLING STATIONS
MISSISSIPPI – LOUISIANA

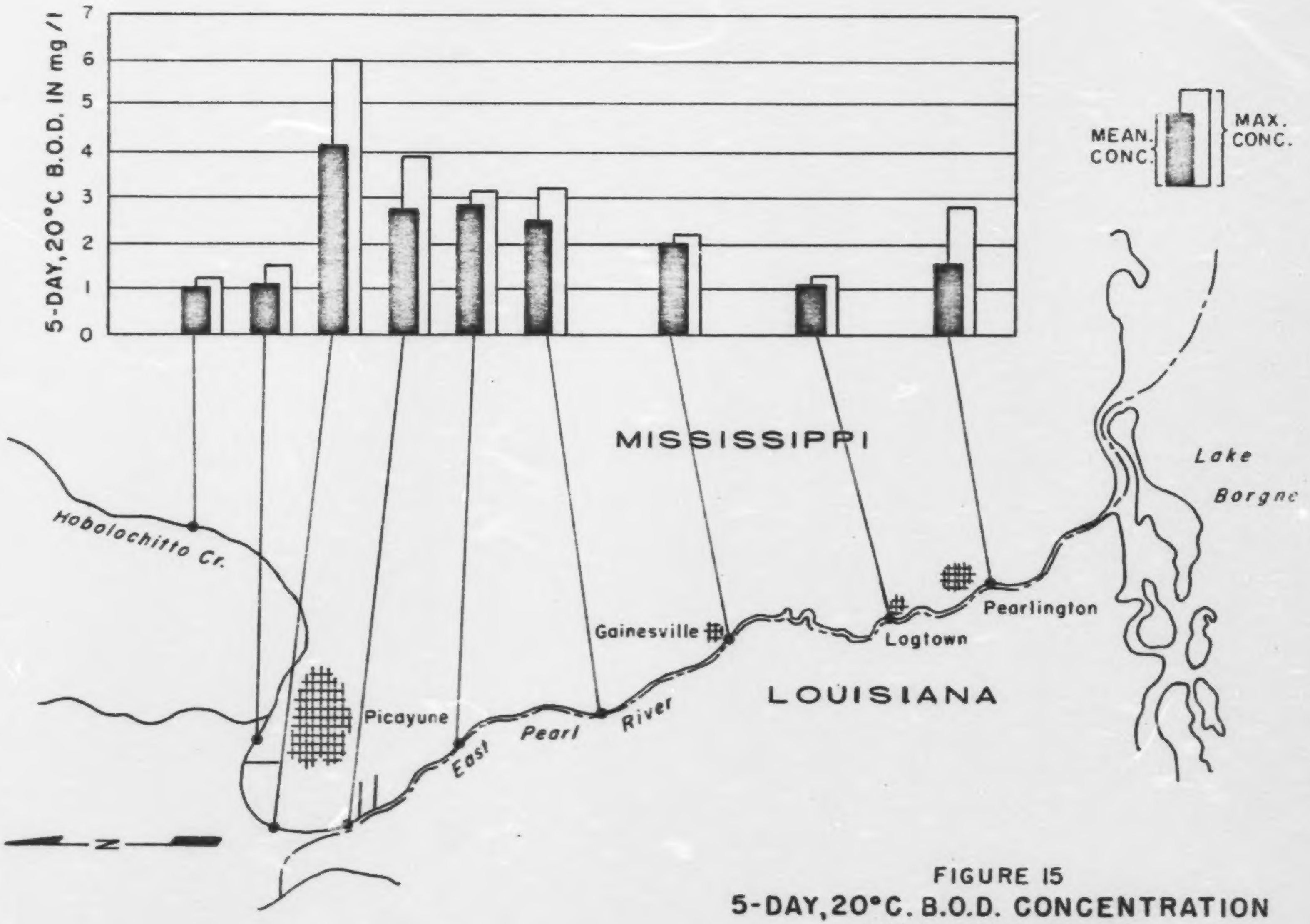


FIGURE 15
5-DAY, 20°C. B.O.D. CONCENTRATION
EAST PEARL RIVER
MISSISSIPPI – LOUISIANA

the B.O.D. showed consistent reduction through Logtown, but then showed a slight increase to a value of 1.6 mg/l at U.S. 90 bridge (EP-5) which is not inconsistent with a clean stream condition.

Dissolved Oxygen

The dissolved oxygen data expressed in milligrams per liter for the East Pearl River during the period of the survey are presented in Figure 16. The clean stream control station (H-16) on East Hobolochitto Creek approximately 8 miles above Picayune, Mississippi, showed an average D.O. concentration of 7.1 mg/l. At Beech Rd. bridge (H-7) the average value was 6.4. At Burnt Bridge (H-4) below the discharge from Crosby Chemicals, Inc., the average D.O. concentration was 2.5 with a maximum of 3.7 and a minimum of 1.6 mg/l, all of which were substantially below the desirable lower limit of 5.0 mg/l. In interstate water, at Jackson's Landing (EP-32) the average value of D.O. increased to 3.9; and to a value of 4.1 at U.S.11 bridge (EP-28). The concentration of dissolved oxygen at the remaining stations on East Pearl River were in excess of 5.0 for average conditions during the period of the survey.

Crosby Chemicals, Inc.

On September 26, 1962, waste discharged by Crosby Chemicals, Inc. drastically altered the stream biology. The most obvious effect was the severe destruction of fish life. The fish kill was observed downstream from Burnt Bridge (H-4) to two miles below old U.S. 11 Bridge (EP-22) a distance of 17 miles. The precise downstream limit is not known, but dead fish were reported at Gainesville, Mississippi (EP-16). This is a total reach of

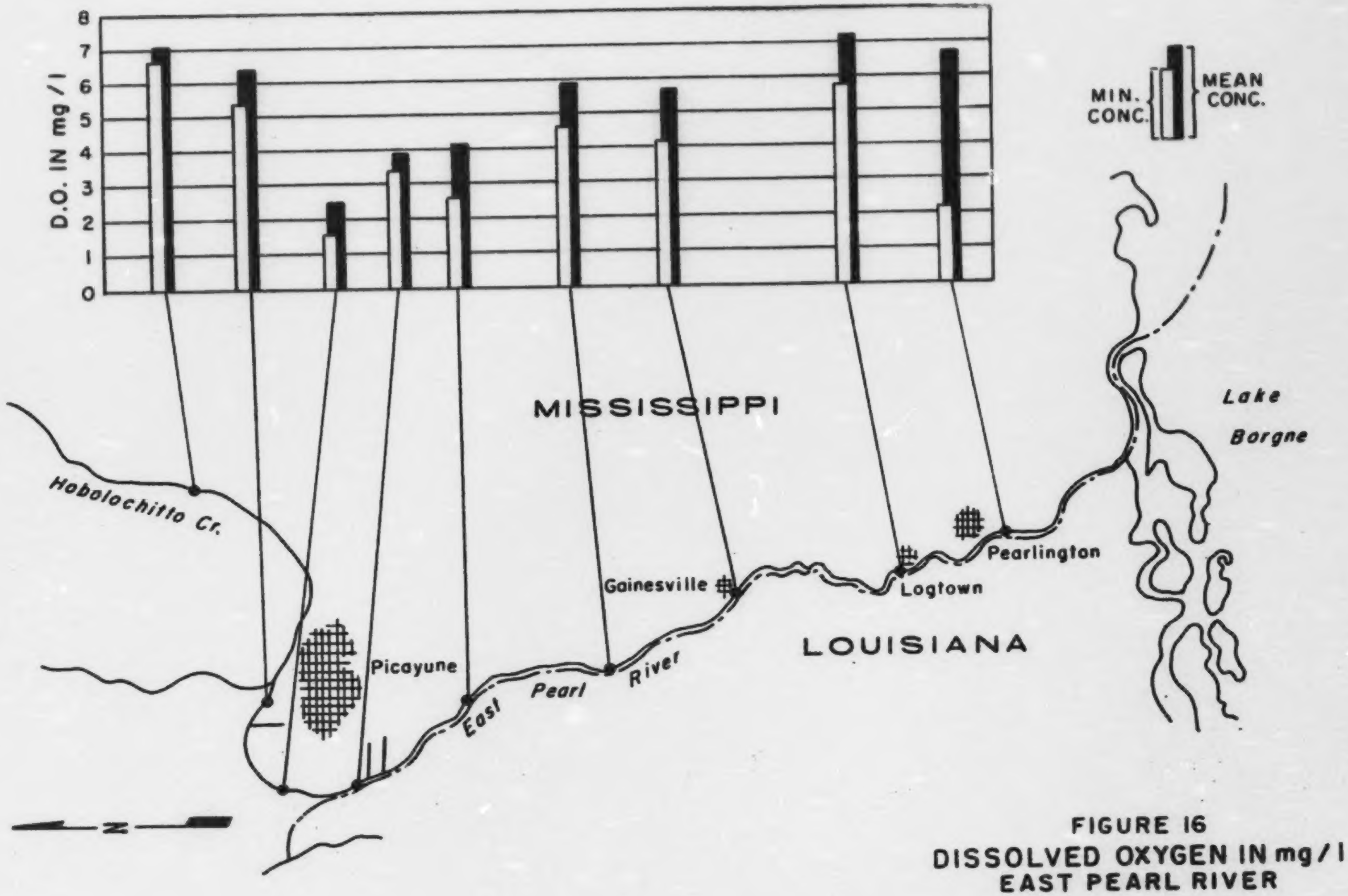


FIGURE 16
DISSOLVED OXYGEN IN mg/l
EAST PEARL RIVER
MISSISSIPPI – LOUISIANA

17 miles of interstate water.

In the upstream areas (H-4 and EP-32), the conditions were sufficiently severe to kill gar. Gar are believed to have survived downstream at EP-22, but game fish (bass, bluegills and crappies) were killed to below Station EP-22. Rough fish and forage fish (minnows, eels, flounders, mullets, catfish and suckers) suffered a similar fate. Of particular interest was the destruction of several (8 observed) large sturgeon (3 to 4 feet in length).

Most of the bottom dwelling animals were also killed in the affected area; the number of kinds found at the survey stations was much reduced (Figure 17), the 3 lower stations being in interstate water. Those organisms that survived are capable of withstanding extended periods of zero D.O. or are capable of obtaining oxygen at the air-water interface. The destruction of bloodworms and sludgeworms at Burnt Bridge (H-4) suggests the presence of an unknown toxic substance since these worms can survive extended periods (several weeks) of zero D.O.[6]

Following the observation of the effects of the unusual discharge to the East Pearl on September 26, the frequency of chemical sampling was increased. In the tabulation of the data, the two series of data are separated and considered separately. The D.O. and the C.O.D. (chemical oxygen demand) data are presented in Figures 18 and 19. These figures are isometric presentations. Concentrations are plotted vertically, time is plotted across the figure, and the river miles are plotted up the figure.

In Figure 18 the period of zero D.O. at the various stations is shown as a path increasing in width from Station H-4, below Crosby Chemicals'

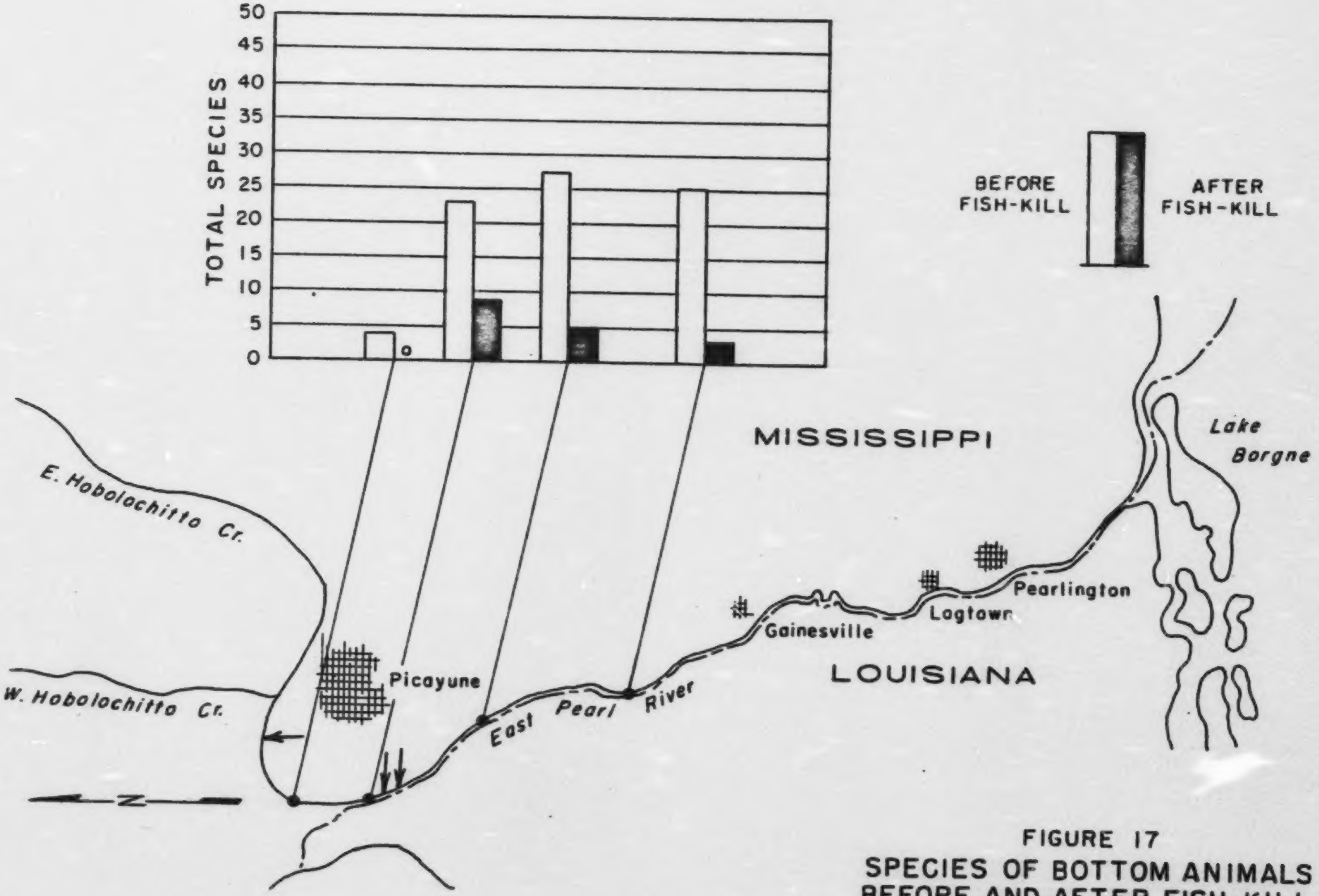

TOTAL SPECIES
50
45
40
35
30
25
20
15
10
5
0
0
BEFORE FISH-KILL
AFTER FISH-KILL
MISSISSIPPI
LOUISIANA
Lake Borgne
E. Hobolochitto Cr.
W. Hobolochitto Cr.
Picayune
East Pearl River
Gainesville
Logtown
Pearlington
N

FIGURE 17
SPECIES OF BOTTOM ANIMALS
BEFORE AND AFTER FISH-KILL
EAST PEARL RIVER
MISSISSIPPI – LOUISIANA

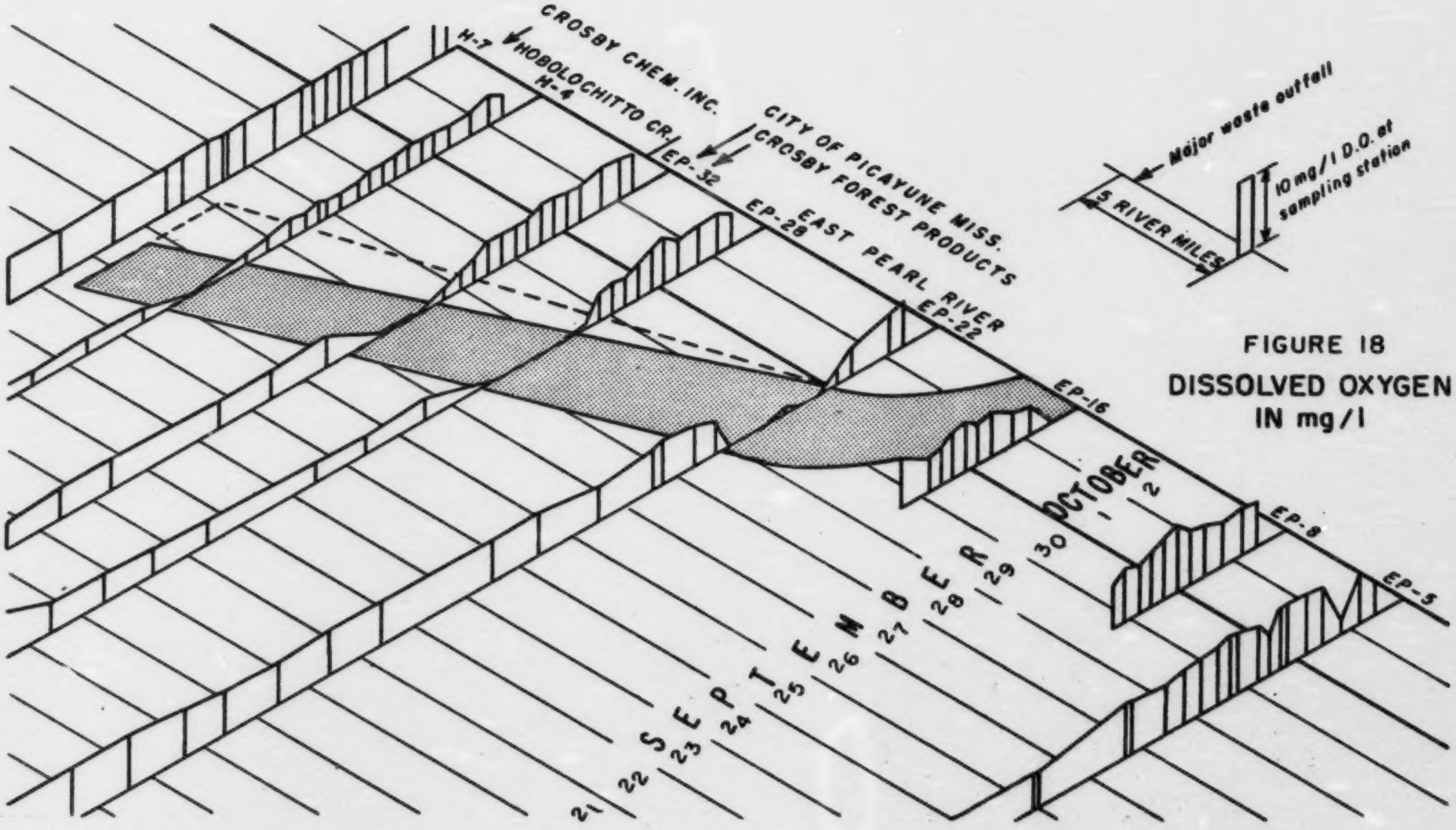


FIGURE 18
DISSOLVED OXYGEN
IN mg/l

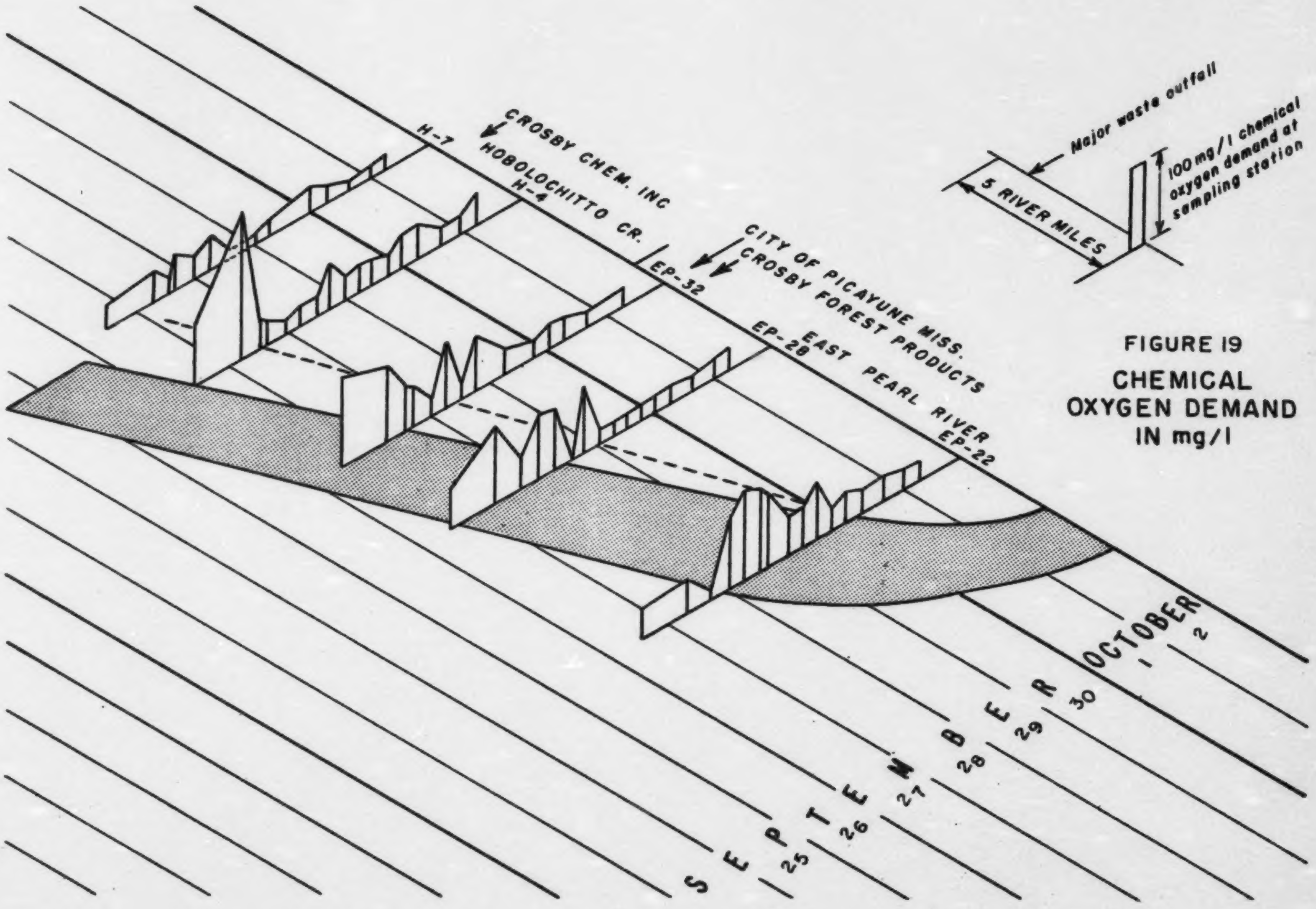


FIGURE 19
CHEMICAL OXYGEN DEMAND IN mg/l

outfall, down to EP-16 at Gainesville, where the tide slows the river velocity and dilution and mixing causes the path to curve away. The persistence of zero oxygen conditions varied from several hours to two days or more, and low D.O. periods prevailed for longer periods of time in the 17 mile reach of interstate water shown in Figure 18.

In Figure 19 the zero D.O. path from Figure 18 is shown again. There are no C.O.D. data available previous to about noon on the 27th so that values cannot be shown for an earlier time. At the Beech Road bridge control station (H-7) the average C.O.D. was 25.9 mg/l with a range from 12.7 to 47.0. Maximum observed values of C.O.D. at the various stations were as follows:

171 at H-4

105 at EP-32

77 at EP-28

107 at EP-22

The higher values of C.O.D. correspond with the zero D.O. path, and also suggest a later discharge of organic material without so much immediate oxygen demand as the initial discharge. Values of C.O.D. at Station EP-16 are not shown because the concentration of chlorides from the salt water interfered with the determination at that station and below.

In Figures 18 and 19, all of the East Pearl River is interstate water.

The chemical sample collected at EP-28 (in interstate water) on September 27, 1962 at 5:20 P.M. was subjected to additional analysis. A petroleum ether extract to determine the amount of oil showed a negligible amount of ether extractible material. A second aliquot was extracted with chloroform and prepared for infra-red study. An interpretation of the infrared spectrum indicated that the most probable organic contaminants in the sample were fatty acids with and without attached benzene rings. Resin acids possess similar structures. It may be assumed, then, that the pollutants in this case were derived from the tall oil processing operations. The infrared spectra suggested considerable oxidation indicating that the original waste material had been partially oxidized in the holding pond or in the stream. Additional analyses were made for phenol and zinc with negative results.

It is reported[7] that the minimum lethal concentration of the sodium salt of the resin acid fraction of tall oil soap to minnows is 1 ppm.

EFFECTS OF WASTES ON WATER QUALITY

LOWER PEARL

Bottom dwelling organisms indicate that a minimum 11 miles of the Pearl River were highly degraded (from Bogue Lusa Creek to Pool's Bluff Sill), and an additional 2 miles (Coburn Creek to Bogue Lusa Creek) was degraded on the Louisiana side. The recovery stretch downstream from Pool's Bluff Sill to P-50 provides a minimum additional 13 miles of stream that was partially degraded. The total of these segments show pollutional effects on the bottom dwelling organisms for a minimum of 26 miles, in interstate water.

A 1950 study on the "Lower" Pearl River[1] indicated that a minimum of 43 miles of stream exhibited pollutional effects on the biota. A major factor in the reduction of the length of the polluted reaches of the stream may be the installation of the navigation sill at Pool's Bluff (P-63.5) since the 1950 study. The impoundment caused by the construction of Pool's Bluff Sill provides for sedimentation of the fibers within the pool so that they are not distributed down a greater reach of the stream. The water spilling over the dam is effectively reaerated.

Discussions with fishermen along the river indicated that fishing was not as good in the Bogue Lusa Creek to Pool's Bluff reach of the river as in the reaches above or below this degraded area. This consensus of the fishing refers both to the quality of the fish and to the total fish caught. Another estimate by the U. S. Public Health Service stated that fish were adversely affected for a distance of 18 miles.[8] Utilization of nets for fish sampling operations during low flow periods in the Bogue Lusa Creek-Pool's Bluff reach of the stream was impractical because of fouling of the nets by paper fines.[3]

An extensive fish kill (Bogue Lusa Creek to Walkiah Bluff) occurred during the period July 15-16, 1960.[12] This fish kill was attributed to the discharge of a tank of soap and black liquor into the Pearl River by the Bogalusa Division of the Crown Zellerbach Corporation.

The utilization of the degraded stretch of the stream for recreational purposes is limited by the extensive amount of pollution. The presence of floating and suspended solids in the vicinity of Richardson's Landing (P-73) reduces utilization of this access area. The observed density of coliform bacteria throughout the entire reach of the interstate stream surveyed from Louisiana State Highway 10 to U.S. Highway 90 was in excess of 1,000 MPN/100 ml indicating that it would be hazardous to use the river for water contact sports. With the exception of the two end stations, at Louisiana State Highway 11 and U.S. 90, all stations showed an average total coliform density in excess of 5,000 MPN/100 ml which is considered to be the upper limit for general recreational use of the stream.

EAST PEARL

On Hobolochitto Creek at and above Beech Road the concentration of coliform organisms was of a magnitude to make the stream unsafe for water contact sports.

Prior to the unusual waste discharges on September 26, 1962, data obtained from sampling bottom dwelling organisms indicate that in the intrastate reaches of the stream, 4.8 miles (Crosby Chemical to Farr's Slough below Burnt Bridge) were degraded and 2.3 miles (on down to the state line) were in the process of recovery. An additional one mile of interstate water may be added to the recovery zone. A total of 8.1 miles of stream were thus affected by pollution, other than that measured by density of total coliform organisms.

Under stream conditions prevailing before September 26, 1962, the interstate waters of the East Pearl River were degraded for legitimate recreational uses by relatively high coliform densities. Water contact sports would be unsafe.

As a result of the unusual discharges from Crosby Chemicals, Inc., the recovery of the fish population will undoubtedly take a few years. Some fish survived by ascending tributaries, and would re-enter the stream forming a nucleus for repopulation. Within a year or two reproduction and immigration could re-establish a number of fish; however, many of these would be small and it would take time to grow catchable fish. Some examples of growth rates are as follows:[9]

	Length, Inches	Age, Years
Channel Catfish	8-16	3
Channel Catfish	15-28	6
Flathead Catfish	8-16	3
Flathead Catfish	15-29	6
Largemouth Bass	8-18	3
Bluegills	3-8	1
Bluegills	3-9	3

Removal of bottom organisms would reduce the rate of recovery of the fish population since these animals are an important food supply for fishes. Many forms of bottom animals should be re-established within a year, but a longer period of time may be necessary for the development of a normal population.

SALT WATER

The sanitary survey made by the Louisiana State Board of Health[4] indicates that there are potential sources of pollution to the oyster-growing areas. Their survey and the survey reported here did not show any unacceptable concentrations of coliform at the beds during the surveys.

SUMMARY AND CONCLUSION

During the period September 11 to October 2, 1962, the interstate reaches of the Pearl River, downstream from the northeast corner of Louisiana, the East Pearl River, and the oyster beds of Mississippi Sound were surveyed to determine the extent of the pollution of these interstate waters.

The interstate waters of the two rivers are used for fishing and boating and there is a potential use for water skiing.

The Pearl River was polluted for approximately 26 miles below the mouth of Bogue Lusa Creek. The source of this pollution was the untreated sewage from the City of Bogalusa, Louisiana, and the wastes from the integrated kraft pulp and paper mill operated by the Bogalusa Division of the Crown Zellerbach Corporation.

The bacterial pollution in the raw sewage from the City attained densities 168 times the accepted maximum value for water contact sports and nearly 34 times that for general recreation. The solids in the sewage would have created an unsightly condition in the stream but the contribution from the city was far overshadowed by the wastes discharged from the pulp and paper mill.

The lost fiber from the mill had created a mound of material at the mouth of Bogue Lusa Creek. Other mill solids and fibers settled on the bottom of the river and the gases of decomposition bubbled to the water surface accompanied by partially decomposed sludge which floated on the surface of the water in clumps of assorted sizes. Oily wastes from the mouth of the creek clung to any object at the waterline, especially boats at Richardson's Landing. The oxygen-consuming wastes from the pulp and paper mill and the decomposing sludge above Pool's Bluff Sill lowered the D.O. in the water to average values of 4.0 mg/l during the survey. A value of 1.1 mg/l had been predicted for high temperature low flow periods and was subsequently observed by the Louisiana Stream Control Commission personnel in June, 1963.

The degradation of the stream, which was observed at the surface, was confirmed by biological investigations of the bottom of the stream where great numbers of a few types of pollutional tolerant worms were found.

The sedimentation provided above Pool's Bluff Sill and the reaeration of the water falling over the Sill, 9 miles below Bogue Lusa Creek, improved the appearance and dissolved oxygen of the stream below the Sill, but the biological investigations indicated that the stream did not show positive signs of recovery within 7 miles below the Sill, and not until it had flowed another 10 miles had the stream recovered from the wastes discharged from Bogue Lusa Creek. A minimum average D.O. of 5.3 mg/l was observed 18 miles below the Sill and a minimum average value of 4.6 mg/l is to be expected at lower stream flows, with similar waste loads.

On the East Pearl River the intrastate waters in Hobolochitto Creek were polluted by the waste discharges from Crosby Chemicals, Inc. The D.O. was reduced to an average value of 2.5 mg/l during the survey and the biological samples showed distinct adverse effects from pollution.

The interstate waters of the East Pearl River started to recover from the industrial pollution above Jackson's Landing but the raw sewage discharged to the river below Jackson's Landing by the City of Picayune, Mississippi, developed bacterial densities in the river 120 times the maximum value acceptable for water contact sports, and 24 times that for general recreation.

A discharge or discharges from Crosby Chemicals, Inc. on or about September 26, 1962, killed great numbers of fish in Hobolochitto Creek and in at least 17 miles of interstate water. Bottom organisms were also reduced to only a few tolerant species.

It is concluded that:

1. Untreated municipal sewage discharged by the Cities of Bogalusa, Louisiana, and Picayune, Mississippi, endangers the health or welfare of persons in Mississippi and Louisiana.
2. Pulp and paper mill wastes discharged by the Bogalusa Division of the Crown Zellerbach Corporation endangers the health or welfare of persons in Mississippi.
3. Industrial wastes discharged by Crosby Chemicals, Inc. endanger the health or welfare of persons in Louisiana.
4. This pollution of interstate waters is subject to abatement under the Federal Water Pollution Control Act.

APPENDICES

SUPPLEMENTARY REPORT ON UPPER PEARL RIVER

BACKGROUND

PREVIOUS SURVEYS

A series of surveys were made on the Pearl River by the Mississippi Game and Fish Commission between April 1959 and September 1960 and reported April 30, 1961.[10]

"Oxygen concentrations were in the desirable range for normal aquatic life at all stations on the sampling dates except the ones immediately below the Jackson area." The results of the bottom sampling substantiated the contention that septic zones existed at stations below Jackson, and the river was recovering from pollution at the Byram bridge. The only station on the river below Bogalusa, Louisiana, was at Upper Walkiah Bluff.[10]

PRESENT SURVEY

Chemical and bacteriological samples were collected and analyzed by the Mississippi State Board of Health during the period September 17 to 28, 1962, from above the city of Jackson, Mississippi, to about 100 miles below the City (P183), and from the mouth of the Strong River. Samples were collected during the same period above and below Columbia, Mississippi, by the local sanitarian and shipped to the U. S. Public Health Service trailer at Bogalusa, Louisiana for analysis.

THE AREA

The economy of the Pearl River watershed is based on various forms of agriculture. On the rolling hills beef and dairy cattle are grazed, and some corn and cotton is grown. Most of the land, hills and river bottoms, is in forests which produce marketable timber for lumber and pulp wood. The major manufacturing center is the Jackson Metropolitan Area.

The Upper Pearl is shown on Figure 20.

WATER USES

WATER SUPPLY

The City of Jackson, Mississippi, obtains a municipal water supply from the Pearl River above a low-head dam, upstream from the city. This is the only known source of drinking water on the entire river system.

RECREATION

The Pearl River System is used throughout its length as a fishing stream.

STOCK WATERING

Dairy cattle are excluded from the stream and watered at farm ponds and from wells. Some stock are allowed to graze in the woods of the river bottoms and have access to the stream particularly in the upper reaches where the forest is not so heavy.

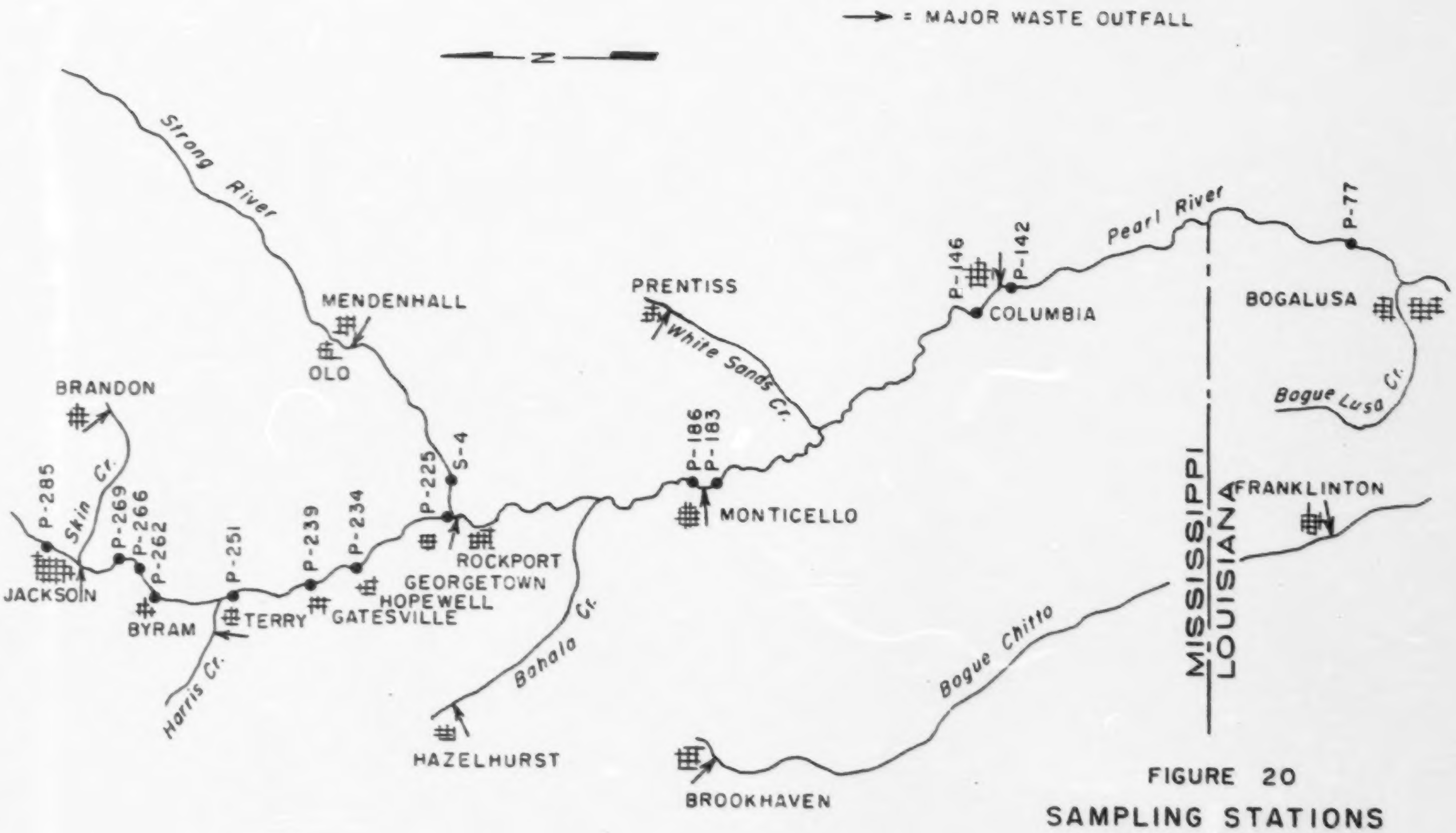

→ = MAJOR WASTE OUTFALL
N
Strong River
MENDENHALL
OLO
BRANDON
P-285
Skin Cr.
P-269
P-266
P-262
JACKSOIN
BYRAM
P-251
TERRY
Harris Cr.
P-239
P-234
GATESVILLE
HOPEWELL
GEORGETOWN
P-225
S-4
ROCKPORT
Bahala Cr.
HAZELHURST
PRENTISS
White Sands Cr.
P-186
P-183
MONTICELLO
BROOKHAVEN
P-146
P-142
COLUMBIA
Pearl River
Bogue Chitto
MISSISSIPPI
LOUISIANA
P-77
BOGALUSA
Bogue Lusa Cr.
FRANKLINTON

FIGURE 20

SAMPLING STATIONS
UPPER PEARL RIVER
MISSISSIPPI – LOUISIANA

SOURCES OF WASTES

MUNICIPAL

The untreated sewage from the Jackson Metropolitan Area is discharged to the Pearl River from an estimated population of 150,000 people.

The untreated wastes from an estimated population of 1400 people at Monticello are discharged to the Pearl River. At Columbia the garbage and refuse from the community are dumped on the banks of the stream above the city and the refuse is encroaching on the stream. The City of Columbia has seven different outlets to the stream through which untreated sewage is discharged. There is a sewage lagoon under construction by force account which will serve approximately 25 percent of the estimated population of 6,000.

INDUSTRIAL WASTES

The industrial wastes from the Jackson Metropolitan Area were not segregated from the municipal wastes in the sampling program. One industry, the Filtros Corporation, is known to be lagooning some acid wastes before discharging them to the stream.

PRESENTATION OF DATA

GENERAL

Tabulated chemical and bacteriological data are presented in Appendix A, and tabulated biological data are presented in Appendix B. Summarized data are presented in this section of the report in various graphical forms.

Sampling stations occupied during this survey for the collection of chemical and bacteriological data are listed in Table 5. Stations occupied for the collection of biological samples and observations were at these same stations or intermediate points.

A summary of stream flow data is presented in Table 6. Stream flows were reasonably uniform during the period of sampling, and were well below the average flows for the streams involved, but were not down to minimum stream flows.

The concentration or amount of organic pollutional material being discharged to the stream or observed in the stream is expressed as 5-day B.O.D. (biochemical oxygen demand) and is generally referred to simply as B.O.D. in this report. The primary effect on the stream of this organic pollutional material is observed as D.O. (dissolved oxygen).

PEARL RIVER SURVEY - MISSISSIPPI

SAMPLING STATIONS FOR CHEMICAL AND BACTERIOLOGICAL SAMPLES

TABLE NO. 5

STATION NUMBER	RIVER MILES	LOCATION	TYPE OF SAMPLE	IMMEDIATE UPSTREAM WASTE
		STRONG RIVER (River Mile 223.1)		
S 4	4.2	Bridge on County Road	Bridge	None
		UPPER PEARL RIVER		
P285	284.8	Low-head dam at City of Jackson water plant	Bank	None
P269	269.4	End of Elton Road off U. S. 51, Hinds County, Miss.	Bank	City of Jackson
P266	265.6	Wansley's farm, Rankin County, Miss. Sect. line 15-16, T.4 N., R.1 E.	Bank	" "
P262	261.9	Bridge near Byram, Miss.	Bridge	" "
P251	251.5	Bridge near Terry, Miss.	Bridge	" "
P239	239.0	Bridge near Gatesville, Miss.	Bridge	" "
P234	234.4	Bridge near Hopewell, Miss.	Bridge	
P225	225.1	Bridge on State Hwy. 28 at Georgetown, Miss.	Bridge	
P186	186.2	Opposite school, Monticello, Miss.	Bank	None
P183	183.2	Ward's farm, Lawrence County, Miss.	Bank	Monticello, Miss.
P146	146	Chamber of Commerce property	Boat	None
P142	142	Near public school property	Boat	City of Columbia
P142	141	Pittman property	Boat	" "

PEARL RIVER SURVEY - MISSISSIPPI

STREAM FLOWS IN CUBIC FEET PER SECOND

TABLE NO. 6

Gaging Station	Avg. Daily	Min. of Record	Sept. 11 - 30, 1962 Avg.	Min.	Max.
PEARL RIVER					
Jackson, Miss.	3786	78	232	141	364
Monticello, Miss.	6188	289	580	458	839
Columbia, Miss.	7375	705	1099	858	1520
Bogalusa, La.	8909	1100	1947	1700	2310

In those reaches of the stream where the D.O. exceeds 5 mg/l, satisfactory stream conditions would be expected as far as dissolved oxygen is concerned. An indicator of pathogenic or disease-bearing bacteria and viruses was observed and reported as coliform concentration in terms of most probable number (MPN) per 100 ml. A more specific indicator of the source of bacteriological pollution involves bacteria specifically of fecal origin and is expressed in terms of MPN of fecal coliforms per 100 ml. For water contact sports the total coliform concentration should not exceed 1,000 MPN, and for general recreational use and surface water supplies where adequate water treatment plants are in use the total coliform concentration should not exceed 5,000 MPN, according to public health authorities.

The general location of sampling stations occupied on the Upper Pearl River during this survey are indicated in Figure 20, and chemical and bacteriological data are summarized in Figures 21, 22 and 23.

STRONG RIVER

Station S4 near the mouth of the Strong River was occupied in order to determine whether or not significant pollution was reaching the Pearl River from sources on the Strong River. Pollutional material being discharged from the Strong River was insignificant, especially in comparison with that existing in the Pearl River immediately above the mouth of the Strong River (P225).

JACKSON

Station P-285, which is the raw water intake for the City of Jackson, is an example of a clean stream station on the Pearl River and serves as a base line for the Upper Pearl.

For the first four stations below the City of Jackson there was not any dissolved oxygen present in some samples during the survey, and for the first station below Jackson the presence of dissolved oxygen was never observed. For the first three of these four stations the average coliform density was from two to more than seven million MPN/100 ml. In a previous survey[10] it was indicated that the major pollutional load for the Pearl River was derived from the City of Jackson. The City of Jackson is still the major pollutional load on the Pearl River within the State of Mississippi.

The number of bottom dwelling species was reduced to four immediately below Jackson compared with 28 species immediately above Jackson.[10] The species below Jackson were two types of sludgeworms, a leech, and an aquatic moth. This degraded river bottom was "outlined" with a red border of sludgeworms along the river banks for 20 miles below Jackson and sludgeworms numbers 21,000 per square foot. With the exception of gar, no fish were found in this previous survey immediately below Jackson. Even 20 miles below Jackson the fish population was not yet normal compared with the normal fish population of the river. The pollutional influence on fisheries was estimated to extend for 40 to 60 miles below Jackson, which would be below the mouth of the Strong River (P-225).[10]

TERRY

The first four stations below Jackson included that reach of the river down to Terry, Mississippi. The next three stations below Terry, which is down to the mouth of the Strong River and includes Station P-225, are in the reach of the Pearl River which is recovering from the heavy pollutional effects originating in Jackson; the concentration of B.O.D. continues to be reduced, the dissolved oxygen is on the increase, and the coliform concentration continues to decrease as the bacteria die off.

MONTICELLO

From the observations made at the sampling stations above and below Monticello it does not appear that the oxygen was adversely affected by any wastes discharged at Monticello. However, there was an appreciable increase in coliform concentration.

COLUMBIA

The samples collected above and below Columbia showed a very substantial increase in coliform densities below Columbia. No significant pollutional influence on the biology of the stream was observed above (1.5 miles) or below (5.0 miles) Columbia.

The utilization of the stream's banks as a "town dump" by the City of Columbia does not seriously influence the biota of the stream. The major detriment of this dump is its effect on the aesthetic and recreational value of the stream. These effects are not confined to the immediate vicinity of the dump, but are obvious downstream. Trash, in its many forms, is transported by the river, especially during high water periods, and deposited downstream on the river bottom, along the bank, and suspended in low hanging trees and brush.

EFFECTS OF WASTES ON WATER QUALITY

The wastes discharged to the Pearl River from the Jackson Metropolitan Area degrade the stream between Jackson and Terry to such an extent that legitimate use of the water is prevented or is extremely hazardous to human beings. In the recovery zone between Terry and the mouth of the Strong River, legitimate use is still restricted and the stream never returns to a quality equal to that above Jackson. It is regrettable that in a densely populated part of the state the principal stream is not useable for recreation, and is unable to support a normal fish population.

The wastes discharged by other communities along the Upper Pearl pollute the stream with bacteria for short reaches so that water contact sports would be hazardous to human beings. Aquatic life is apparently not affected.

APPENDIX A

CHEMICAL AND BACTERIOLOGICAL DATA

APPENDIX A

CHEMICAL AND BACTERIOLOGICAL DATA

SAMPLING

The location of sampling stations and type of sample or means of sampling is indicated in Table 1.[5] Samples taken from a bridge were generally taken at midstream. Bank samples were taken as far from the bank as physically possible by reaching and/or stepping on projections from the bank. Samples were not taken from slack water. Boat samples were taken anywhere from one boat length from the bank to midstream.

Samples for D.O. determinations were taken approximately 3 feet below the surface with a submerged dissolved oxygen sampler. Samples for B.O.D. determinations were taken with an open bottle approximately 3 feet below the surface. Bacteriological samples were taken at or near the surface in sterile bottles. Samples for other chemical analyses were taken in a manner similar to those for B.O.D. determinations. Samples for D.O., B.O.D., and bacteriological samples were iced immediately and delivered to the laboratories in iced containers.

Samples from Stations P-285 to and including P-183 were collected and analyzed by the Mississippi State Board of Health laboratory at Jackson, Mississippi. Samples from Stations P-146 and P-142 were collected and shipped by bus to Bogalusa. Samples from Stations P-77 to WP-8 and H-16 to EP-5 were collected and analyzed by the U. S. Public Health Service trailer laboratory at Bogalusa. Samples from Station EP-4 to S-10 as shown in Figure 21 were collected and analyzed by the laboratory at Gulfport, Mississippi.

Maximum time from collection to delivery at the laboratory was six hours. Date and time of collection is recorded in Tables A1 to A24 inclusive.

TABLE A-1 - UPPER PEARL RIVER

DATE	TIME	FLOW C.F.S.	D.O. mg/l	TEMP. °C	% SAT	D.O. 1000lbs/DA	B.O.D. mg/l	B.O.D. 1000lbs/DA	COLIFORM MPN/100ml	B.P.E.	E.COLI MPN/100ml	pH	SALINITY P.P.T.	C.O.D. mg/l	T. ALK. mg/l	HARDNESS mg/l	TURBID	COLOR	T.S.S. mg/l	V.S. mg/l
P285 - Low-head dam at City of Jackson water plant																				
17SEP62	1130a	218	4.6	29	58	5.4	0.8	0.9	170	2	170	7.0			19	23	155			
18SEP62	1200n	229	5.0	27	62	6.1	0.6	0.7	130	2	130	6.6			20	28	155	40		
19SEP62	115p	343	6.0	27	74	11.1	0.8	1.5	23	0	23	7.1			19	19	55			
20SEP62	1215p	364	6.0	27	74	11.8	0.8	1.6	79	2	23	6.9			16	17	30	35		
21SEP62	130p	316	6.6	27	82	11.2	1.6	2.7	220	4	49	7.1			16	20	25			
24SEP62	1210p	203	6.0	27	74	6.6	0.6	0.7	23	0	23	6.6			16	16	25	35		
25SEP62	1200n	193	6.0	25	72	5.9	0.8	0.8	76	1	2	6.9			17	22	25			
26SEP62	1140a	169	5.6	27	69	5.1	0.4	0.4	23	0	23	7.1			19	24	20	30		
27SEP62	1210p	160	5.3	26	71	5.0	0.6	0.5	79	1	7	7.1			18	18	20			
28SEP62	1200n	146	5.2	25	62	4.1	0.4	0.3	350	3	350	7.0			15	18	10	35		
	Avg.	233	5.7	27	70	7.2	0.7	1.0	117	2	80	7.0			18	20	52	35		
	Max.	364	6.6	28	82	11.8	1.6	2.7	350	4	350	7.1			20	28	155	40		
	Min.	146	4.6	25	62	4.1	0.4	0.3	23	0	2	6.6			15	16	10	30		
	R	218	2.0	3	20	7.7	1.2	2.4	327	4	348	0.5			5	12	145	10		
	n	10	10	10	10	10	10	10	10	10	10	10			10	10	10	5		
P269 - End of Elton Road off U.S. 51, Hinds County, Miss.																				
17SEP62	1040a	240	0.0	28	0	0.0	16.0	20.7	5400000	78315	5400000	6.6			41	39	350			
18SEP62	1130a	250	0.0	27	0	0.0	17.0	22.9	9200000	140760	2400000	6.6			45	34	150	35		
19SEP62	1048a	369	0.0	27	0	0.0	14.0	27.8	5400000	121987	2400000	7.2			36	32	200			
20SEP62	1130a	389	0.0	27	0	0.0	10.0	21.0	2400000	57136	2400000	7.3			31	28	135	35		
21SEP62	1135a	347	0.0	27	0	0.0	14.0	26.2	2400000	50967	2400000	7.3			28	29	60			
24SEP62	1115a	222	0.0	27	0	0.0	6.6	7.9	920000	12490	920000	6.9			32	24	45	35		
25SEP62	1100a	202	0.0	25	0	0.0	10.0	10.9	5400000	66757	3500000	7.1			41	29	30			
26SEP62	1130a	184	0.0	27	0	0.0	14.6	[illegible]	540000	6081	540000	7.1			43	31	20	35		
27SEP62	1115a	174	0.0	26	0	0.0	18.0	[illegible]	24000000	255512	24000000	7.1			46	29	25			
28SEP62	1120a	163	0.0	25	0	0.0	13.3	11.7	16000000	159620	16000000	7.2			48	30	10	35		
	Avg.	254	0.0	27	0	0.0	13.4	18.0	7166000	95084	5996000	7.1			39	30	108	35		
	Max.	389	0.0	28	0	0.0	18.0	27.8	24000000	255512	24000000	7.3			48	39	350	35		
	Min.	163	0.0	25	0	0.0	6.6	7.9	540000	6081	540000	6.6			28	24	10	35		
	R	226	0	3	0	0.0	11.4	19.9	23460000	249431	23460000	0.7			20	15	340	0		
	n	10	10	10*	10	10	10	10	10	10	10	10			10	10	10	5		
P266 - Wensley's farm, Rankin County, Miss.																				
17SEP62	840a	244	0.0	28	0	0.0	9.0	11.8	130000	1941	49000	7.1			45	38	20			
18SEP62	919a	254	0.0	27	0	0.0	5.0	6.8	350000	9441	240000	7.1			41	36	160	40		
19SEP62	830a	374	0.0	27	0	0.0	8.0	16.1	9200000	210577	5400000	7.2			41	34	129			
20SEP62	915a	394	0.5	27	6	1.1	8.0	17.0	5400000	130204	3500000	7.5			38	31	75	40		
21SEP62	922a	392	0.0	27	0	0.0	12.0	22.8	240000	5170	130000	7.5			38	30	75			
24SEP62	833a	225	0.0	27	0	0.0	3.0	3.6	79000	1308	79000	7.0			32	25	15	40		
25SEP62	845a	205	0.0	25	0	0.0	6.0	6.6	79000	991	49000	7.2			34	28	15			
26SEP62	830a	186	0.0	27	0	0.0	5.3	5.3	350000	3984	350000	7.3			41	29	20	35		
27SEP62	825a	177	0.0	26	0	0.0	8.0	7.6	5400000	59495	1400000	7.2			40	30	20			
28SEP62	920a	166	0.0	25	0	0.0	8.3	7.4	5400000	34660	3500000	7.1			43	31	10	40		
	Avg.	258	0.1	27	1	0.1	7.3	10.5	2662800	47276	1469700	7.2			38	31	54	39		
	Max.	394	0.5	28	6	1.1	12.0	22.8	9200000	210577	5400000	7.5			45	38	160	40		
	Min.	166	0.0	25	0	0.0	3.0	3.6	79000	991	49000	7.0			32	25	10	35		
	R	228	0.5	3	6	1.1	9.0	19.2	9121000	209586	5351000	0.5			13	13	150	5		
	n	10	10	10	10	10	10	10	10	10	10	10			10	10	10	5		

TABLE A-2 - UPPER PEARL RIVER

DATE	TIME	FLOW C.F.S.	D.O. mg/l	TEMP. °C	% SAT	D.O. 000lbs/DA	B.O.D. mg/l	B.O.D. 000lbs/DA	COLIFORM MPN/100ml	B.P.E.	E.COLI MPN/100ml	pH	SALINITY P.P.T.	C.O.D. mg/l	T. ALK. mg/l	HARDNESS mg/l	TURBID	COLOR	T.S.S. mg/l	V.S. mg/l
P262 - Bridge near Byram, Miss.																				
17SEP62	930a	250	0.0	28	0	0.0	3.0	4.0	240000	3672	130000	7.1			45	36	20			
18SEP62	1015a	260	1.0	27	12	1.4	3.2	4.5	350000	5569	110000	7.1			46	42	155	45		
19SEP62	915a	380	0.0	27	0	0.0	5.0	10.2	2400000	55814	2400000	7.5			45	34	120			
20SEP62	945a	400	0.8	27	10	1.7	5.0	10.8	540000	13219	79000	7.3			35	32	60	35		
21SEP62	1010a	360	0.8	27	10	1.6	6.5	12.6	11000	242	3300	7.2			36	28	20			
24SEP62	1000a	230	0.6	27	7	0.7	4.0	5.0	92000	1295	92000	7.2			35	27	15	45		
25SEP62	940a	210	0.6	25	7	0.7	4.0	4.5	54000	694	35000	7.2			35	28	15			
26SEP62	1045a	190	0.4	27	5	0.4	8.5	8.7	2400000	27907	2400000	7.3			44	30	20	35		
27SEP62	1050a	180	0.4	26	5	0.4	13.5	13.1	16000000	176256	9200000	7.2			48	31	20			
28SEP62	1030a	170	0.0	25	0	0.0	12.6	11.5	920000	9572	920000	7.2			51	34	10	40		
	Avg.	263	0.5	27	6	0.7	6.5	8.5	2300700	29424	1536930	7.2			42	32	46	38		
	Max.	400	1.0	28	12	1.7	13.5	13.1	16000000	55814	9200000	7.5			51	42	155	45		
	Min.	170	0.0	25	0	0.0	3.0	4.0	11000	242	3300	7.1			35	27	10	35		
	R	230	1.0	3	12	1.7	10.5	9.1	15989000	55572	9196700	0.4			16	15	145	10		
	n	10	10	10	10	10	10	10	10	10	10	10			10	10	10	5		
P251 - Bridge near Terry, Miss.																				
17SEP62	1000a	260	0.0	28	0	0.0	3.0	4.2	35000	557	11000	7.1			37	34	20			
18SEP62	1045a	270	2.8	27	35	4.1	4.0	5.8	54000	892	14000	7.3			42	39	25	30		
19SEP62	1000a	390	3.0	27	37	6.3	5.0	10.5	35000	435	24000	7.5			46	32	35			
20SEP62	1015a	420	1.2	27	15	2.7	7.0	15.8	350000	5996	54000	7.6			46	33	40	35		
21SEP62	1040a	370	1.8	27	22	3.6	5.0	10.0	7900	179	7900	7.7			35	35	25			
24SEP62	1030a	240	1.4	27	17	1.8	4.0	5.2	43000	432	43000	7.3			38	28	15	35		
25SEP62	1045a	220	1.3	25	21	2.1	3.2	3.8	3100	42	3100	7.3			35	29	15			
26SEP62	915a	200	1.0	27	12	1.1	3.5	3.8	24000	294	13000	7.3			36	26	20	35		
27SEP62	900a	190	2.2	26	27	2.3	2.5	2.6	35000	407	24000	6.8			35	27	20			
28SEP62	910a	180	1.4	25	17	1.4	3.5	3.4	350000	3656	350000	7.2			45	31	10	35		
	Avg.	274	1.7	27	20	2.5	4.1	6.5	93700	1669	54400	7.3			40	31	22	34		
	Max.	420	3.0	28	37	6.3	7.0	15.8	350000	5996	350000	7.7			46	39	40	35		
	Min.	180	0.0	25	0	0.0	2.5	2.6	3100	42	3100	6.8			35	26	10	30		
	R	240	3.0	3	37	6.3	4.5	13.2	346900	5954	346900	0.9			11	13	30	5		
	n	10	10	10	10	10	10	10	10	10	10	10			10	10	10	5		
P239 - Bridge near Gatesville, Miss.																				
17SEP62	1145a	260	4.7	28	59	6.6	5.1	7.1	2300	37	2300	7.0			34		10			
18SEP62	1013a	270	2.3	27	28	3.3	3.2	4.7	4900	81	2200	7.1			47		5	35		
19SEP62	1220p	390	5.0	27	62	10.5	5.2	10.9	3480	83	1300	7.0			35		5			
20SEP62	900a	430	4.7	27	58	10.9	6.2	14.4	1300	34	2400	6.9			35		5			
21SEP62	1000a	300	2.8	27	35	5.7	3.3	6.8	5420	126	2400	7.0			43	40	30	50		
24SEP62	1230a	250	4.4	27	55	5.9	3.6	4.9	1410	22	40	7.0			28	28	10	35		
25SEP62	1045a	220	3.9	25	47	4.6	4.5	5.3	3480	47	1090	7.0			48	28	10			
26SEP62	1230p	200	4.4	27	55	4.7	5.9	6.4	3480	43	330	7.1			38		10	35		
27SEP62	1230p	190	5.2	26	63	5.3	5.3	5.4	5420	63	460	6.7			35		10	35		
28SEP62	950a	180	4.7	25	56	4.6	4.9	4.8	3480	38	230	6.6			27	27	10	30		
	Avg.	277	4.2	27	52	6.2	4.7	7.1	3467	57	1275	6.9			37	31	10	37		
	Max.	430	5.0	28	63	10.9	6.2	14.4	5420	126	2400	7.1			48	40	30	50		
	Min.	180	2.3	25	28	3.3	3.2	4.7	1300	22	40	6.6			27	27	5	30		
	R	250	2.7	3	35	7.6	3.0	9.7	4120	104	2360	0.5			21	13	25	20		
	n	10	10	10	10	10	10	10	10	10	10	10			10	4	10	6		

TABLE A-3 - UPPER PEARL RIVER

DATE	TIME	FLOW C.F.S.	D.O. mg/l	TEMP °C	% SAT	D.O. 1000lbs/DA	B.O.D. mg/l	B.O.D. 1000lbs/DA	COLIFORM MPN/100ml	B.P.E.	E.COLI MPN/100ml	pH	SALINITY P.P.T.	C.O.D. mg/l	T. ALK. mg/l	HARDNESS mg/l	TURBID	COLOR	T.S.S. mg/l	V.S. mg/l
P234 - Bridge near Hopewell, Miss.																				
18SEP62	1030A	270	4.4	27	55	6.6	5.0	7.3	490	8	40	7.1			14		5	40		
19SEP62	1100A	400	3.9	27	48	8.4	5.2	11.2	1720	42	490	7.2			47		5			
20SEP62	930A	430	3.9	28	49	9.0	3.9	13.7	2210	59	130	6.9			37		5			
21SEP62	1030A	390	5.4	28	68	11.4	6.5	13.7	460	11	230	6.9			40	38	25	45		
24SEP62	1120A	290	5.2	27	64	7.8	5.6	7.5	2210	34	230	7.2			40	27	10	30		
25SEP62	1015A	220	4.2	25	50	5.0	4.4	5.2	5420	73	230	7.2			37	31	5			
26SEP62	1200N	200	5.0	27	62	5.6	5.2	5.6	5420	46	490	7.2			33		10	35		
27SEP62	1200N	190	4.6	26	56	4.7	4.1	4.2	1300	15	230	6.7			38		10	30		
28SEP62	930A	180	4.7	25	56	4.6	5.3	5.1	1720	14	230	6.5			35	25	10	30		
	Avg.	281	4.6	27	56	6.9	5.2	8.2	2588	36	256	7.0			36	30	9	35		
	Max.	430	5.4	28	68	11.4	6.5	13.7	5420	73	490	7.2			47	38	25	45		
	Min.	180	3.9	25	48	4.6	4.1	4.2	460	8	40	6.5			14	25	5	30		
	R	250	1.5	3	20	6.8	2.4	9.5	4960	65	450	0.7			33	13	20	15		
	n	9	9	9	9	9	9	9	9	9	9	9			9	4	9	6		
P225 - Bridge on State Hwy. 28 at Georgetown, Miss.																				
17SEP62	1115A	310	2.3	28	35	4.7	4.6	7.7	790	15	40	7.5			9					
18SEP62	1100A	280	3.6	28	45	5.6	2.9	4.6	480	7	200	7.3			37		5	35		
19SEP62	1110A	410	3.5	28	45	8.0	4.3	9.5	60	2	20	7.2			39		5			
20SEP62	1000A	440	3.2	28	40	7.6	5.7	13.5	2400	65	2400	7.1			37		5			
21SEP62	1110A	400	3.8	27	47	8.2	3.2	6.9	1410	35	490	7.0			40	39	25	30		
24SEP62	1030A	260	2.7	27	33	3.8	3.3	4.6	2400	38	2400	7.0			40	35	10	40		
25SEP62	900A	230	2.7	25	32	3.3	3.1	3.8	3480	49	230	7.0			45	37	5			
26SEP62	1050A	210	3.1	27	38	3.5	4.0	4.5	5420	70	490	7.2			36		10	30		
27SEP62	1130A	200	3.3	26	40	3.6	2.9	3.1	480	5	40	6.5			35		10	25		
28SEP62	840A	190	2.1	25	25	2.2	1.8	1.8	1720	20	230	6.4			33		10	25		
	Avg.	293	3.1	27	38	5.0	3.6	6.0	1848	31	655	7.0			35	37	9	31		
	Max.	440	3.8	28	47	8.2	5.7	13.5	5420	70	2400	7.5			45	39	25	40		
	Min.	190	2.1	25	25	2.2	1.8	1.8	60	2	20	6.4			9	35	5	25		
	R	250	1.7	3	22	6.0	3.9	11.7	5360	68	2380	1.1			36	4	20	15		
	n	10	10	10	10	10	10	10	10	10	10	10			10	3	9	6		
P186 - Opposite school above Monticello, Miss.																				
17SEP62	1000A	789	5.5	28	69	23.6	2.0	8.5	200	10	200	7.1			13		28			
18SEP62	1230P	693	7.8	28	98	29.1	1.7	6.3	230	10	230	7.4			17		5	30		
19SEP62	1030A	594	7.1	28	90	22.7	2.2	7.0	220	8	790	7.1			17		9			
20SEP62	1110A	542	8.3	29	107	24.2	3.9	11.6	460	15	310	6.9			22		10			
21SEP62	1140A	534	8.4	27	104	24.2	2.9	9.3	110	4	110	6.9			23	25	35	25		
24SEP62	945A	572	9.2	27	114	28.4	3.8	11.7	3480	122	2400	7.1			28	25	2	35		
25SEP62	830A	534	9.2	25	110	24.5	3.8	10.9	5420	177	230	7.2			14	30	5			
26SEP62	1015A	506	8.8	27	109	24.0	3.0	8.2	5420	164	3480	7.2			26		5	35		
27SEP62	1045A	490	8.7	26	106	23.0	2.8	7.6	1410	42	230	6.6			34		2	30		
28SEP62	800A	483	7.8	25	93	20.3	2.7	7.9	2180	63	790	6.4			25	22	2	35		
	Avg.	576	8.1	27	100	24.6	2.9	8.7	1907	62	877	7.0			22	26	9	32		
	Max.	789	9.2	29	114	29.1	3.9	11.7	5420	177	3480	7.4			34	30	35	35		
	Min.	483	5.5	25	69	20.3	1.7	6.3	110	4	110	6.4			13	22	2	25		
	R	306	3.7	4	45	8.8	2.2	5.4	5310	173	3370	1.0			21	8	33	10		
	n	10	10	10	10	10	10	10	10	10	10	10			10	4	10	6		

TABLE A-4 - UPPER PEARL RIVER

DATE	TIME	FLOW C.F.S.	D.O. mg/l	TEMP. °C	% SAT	D.O. 1000lbs/DA	B.O.D. mg/l	B.O.D. 1000lbs/DA	COLIFORM MPN/100ml	B.P.E.	E.COLI MPN/100ml	pH	SALINITY P.P.T.	C.O.D. mg/l	T. ALK. mg/l	HARDNESS mg/l	TURBID	COLOR	T.S.S. mg/l	V.S. mg/l
P183 - Ward's farm, Lawrence County, Miss.																				
17SEP62	940A	789	6.4	28	91	27.2	1.9	9.1	11000	531	3100	7.3			14		20			
18SEP62	1255P	693	6.5	29	107	31.7	2.2	9.2	11000	467	1200	7.4			15		5	30		
19SEP62	1000A	594	7.2	28	91	23.1	2.1	6.7	1300	47	3300	7.2			17		5			
20SEP62	1130A	542	8.1	29	104	23.7	3.0	8.8	7000	232	7000	7.0			16		5			
21SEP62	1200N	534	7.6	27	94	21.9	3.8	10.9	4900	160	2200	7.3			23	21	20	20		
24SEP62	900A	572	9.0	26	110	27.7	3.2	9.9	3600	122	2400	7.0			21	22	2	35		
25SEP62	745A	534	7.7	25	92	22.2	3.4	9.8	17200	562	10900	7.2			19	29	2			
26SEP62	950A	506	7.8	27	97	21.3	2.6	7.1	4000	152	4900	7.3			30		5	35		
27SEP62	1015A	490	7.6	26	92	20.1	2.4	6.3	24000	720	3300	6.6			26		5	30		
28SEP62	730A	483	6.9	24	81	18.0	2.3	6.0	54200	1602	24000	6.6			27	25	2	30		
	Avg.	574	7.7	27	95	23.7	2.7	8.2	13898	460	6230	7.1			21	24	7	30		
	Max.	789	9.0	29	110	31.7	3.8	10.9	54200	1602	24000	7.4			30	29	20	35		
	Min.	483	6.4	24	81	18.0	1.9	6.0	1300	47	1200	6.6			14	21	2	20		
	R	306	2.6	5	29	13.7	1.9	4.9	52900	1555	22800	0.8			16	8	18	15		
	n	10	10	10	10	10	10	10	10	10	10	10			10	4	10	6		
P146 - Chamber of Commerce property above Columbia, Miss.																				
13SEP62	310P	1060	8.8	31	117	50.3	2.5	14.3	490	32	70	7.1								
17SEP62	145P	1510		30			1.4	11.5	1410	130	40	7.0			13	12	21	21		
18SEP62	155P	1320	8.6	29	111	61.2	3.2	22.8	4900	396	70	7.5								
19SEP62	1000A	1200	8.2	29	103	54.6	1.4	9.7	4400	394	20	7.0			16 •		20	22		
20SEP62	130P	1120	8.6	28	109	51.9	1.6	9.7	1720	114	20	6.9			16					
21SEP62	130P	1040	8.4	26	102	47.1	1.5	8.4	3300	210	110	6.4			14					
24SEP62	410P	1050	9.0	26	109	50.9	3.7	20.9	760	17	20	6.6			15					
25SEP62	150P	1050	9.0	26	109	50.9	1.9	10.8	170	11	40	6.6			18					
26SEP62	230P	1000	9.4	27	117	52.7	2.4	12.9	790	48	40	6.3			18		21	22		
27SEP62	140P	963	9.5	25	113	49.3	2.4	12.5	330	19	40	6.4			16					
28SEP62	140P	928	9.1	27	113	45.5	2.6	12.8	490	28	70	6.7			16					
	Avg.	1120	8.9	28	110	51.4	2.2	13.4	1705	127	48	6.8			16	12	21	22		
	Max.	1510	9.5	31	117	61.2	3.7	22.8	4900	396	110	7.5			18	12	21	22		
	Min.	928	8.2	25	102	45.5	1.4	8.4	170	11	20	6.3			13	12	20	21		
	R	582	1.3	6	15	15.7	2.3	14.4	4730	385	90	1.2			5	0	1	1		
	n	11	10	11	10	10	11	11	11	11	11	11			9	1	3	3		
P142 - Near public school property below Columbia, Miss.																				
13SEP62	400P	1060	8.7	31	116	49.7	2.7	15.4	240000	15569	49000	7.1								
17SEP62	230P	1510		30			1.7	13.8	172000	15895	46000	7.1			12	12	20	22		
18SEP62	320P	1320	8.6	30	113	61.2	3.0	21.3	17200	1359	3300	7.4								
19SEP62	1045A	1280	8.2	30	107	56.6	1.4	9.7	49000	3438	7700	6.9			15		15	22		
20SEP62	215P	1120	8.6	28	109	51.9	2.0	12.1	13000	891	4900	6.9			14					
21SEP62	230P	1040	8.8	27	108	49.3	1.6	9.0	33000	2100	2700	7.0			18					
24SEP62	330P	1050	9.1	27	113	51.5	2.4	13.6	9400	604	3100	6.7			14					
25SEP62	230P	1050	9.4	26	114	53.2	2.0	11.3	7900	508	4900	6.7			16					
26SEP62	150P	1000	9.0	27	112	48.5	2.0	10.8	13000	796	1700	6.5			16		22	21		
27SEP62	230P	963	9.7	27	121	50.3	2.1	10.9	33000	1945	3300	6.5			16					
28SEP62	230P	928	9.8	27	121	49.0	3.6	18.0	33000	1874	7900	6.4			16					
	Avg.	1120	9.0	28	113	52.1	2.2	13.3	56409	4128	12245	6.8			15	12	19	22		
	Max.	1510	9.7	31	121	61.2	3.6	21.3	240000	15895	49000	7.4			18	12	22	22		
	Min.	928	8.2	26	107	48.5	1.4	9.0	7900	508	1700	6.4			12	12	15	21		
	R	582	1.5	5	14	12.7	2.2	12.3	232100	15387	47300	1.0			6	0	7	1		
	n	11	10	11	10	10	11	11	11	11	11	11			9	1	3	3		

TABLE A-5 - UPPER PEARL RIVER

DATE	TIME	FLOW C.F.S.	D.O. mg/l	TEMP. °C	% SAT	D.O. 1000lbs/DA	B.O.D. mg/l	B.O.D. 1000lbs/DA	COLIFORM MPN/100ml	B.P.E.	E.COLI MPN/100ml	pH	SALINITY P.P.T.	C.O.D. mg/l	T. ALK. mg/l	HARDNESS mg/l	TURBID	COLOR	T.S.S. mg/l	V.S. mg/l
5A - Bridge on County Road near mouth of river																				
17SEP62	1105a	56	6.9	26	88	2.1	0.6	0.2	1900	6	460	7.5			10		5			
18SEP62	1130a	49	7.3	26	89	1.9	0.4	0.1	1720	5	460	7.2			10		5	30		
19SEP62	1130a	46	7.2	27	89	1.8	2.2	0.5	1300	4	790	7.1			10		2			
20SEP62	1015a	44	7.2	25	86	1.7	1.6	0.4	1200	3	460	7.2			10		2			
21SEP62	1050a	43	7.2	24	84	1.7	2.3	0.5	330	1	330	7.2			9	14	15	30		
24SEP62	1050a	40	7.6	24	89	1.6	1.1	0.2	2700	7	490	7.1			13	11	2	35		
25SEP62	920a	40	7.1	25	85	1.5	1.2	0.3	2210	5	1720	7.2			15	21	2			
26SEP62	1115a	39	7.2	26	88	1.5	1.8	0.3	3480	8	330	6.6			13		2	25		
27SEP62	1115a	40	7.6	24	89	1.6	0.6	0.1	1300	3	330	6.5			15		2	30		
28SEP62	900a	40	6.9	22	78	1.5	0.7	0.2	700	2	230	6.3			10	29	2	30		
	Avg.	44	7.2	25	86	1.7	1.2	0.3	1672	4	560	7.0			12	19	4	30		
	Max.	56	7.6	27	89	2.1	2.3	0.5	3480	8	1720	7.5			15	29	15	35		
	Min.	39	6.9	22	78	1.5	0.4	0.1	330	1	230	6.3			9	11	2	25		
	R	17	0.7	5	11	0.6	1.9	0.4	3150	7	1490	1.2			6	18	13	5		
	n	10	10	10	10	10	10	10	10	10	10	10			10	4	10	6		

TABLE A-6 - LOWER PEARL RIVER

DATE	TIME	FLOW C.F.S.	D.O. mg/l	TEMP. °C	% SAT	D.O. 1000lbs/DA	B.O.D. mg/l	B.O.D. 1000lbs/DA	COLIFORM MPN/100ml	B.P.E.	E. COLI MPN/100ml	pH	SALINITY P.P.T.	C.O.D. mg/l	T. ALK. mg/l	HARDNESS mg/l	TURBID	COLOR	T.S.S. mg/l	V.S. mg/l
P77 - Drawbridge on Louisiana State Hwy. 10																				
11SEP62	1035A	2310	7.6	29	96	94.6	2.7	33.6	1700	240	200	6.9								
12SEP62	1200N	2060	7.2	28	91	79.9	2.0	22.2	940	119	20									
13SEP62	1030A	2000	7.1	29	90	76.5	2.1	22.6	700	86	110	6.9								
14SEP62	110P	1940	7.4	29	95	77.4	2.2	23.0	1720	204	20	7.0								
24SEP62	300P	1820	8.5	24	100	83.4	2.2	21.6	3300	358	20	7.0			14					
25SEP62	1010P	1820	7.9	23	91	77.5	1.5	14.7	1750	195	20	6.8			12					
26SEP62	930A	1820	7.8	23	89	76.5	1.7	16.7	1720	192	20	6.7			13		21	21		
27SEP62	1000A	1820	5.4	22	88	53.0	1.8	17.7	4900	546	20	6.8			12					
28SEP62	210P	1760	8.5	22	97	80.6	2.1	19.9	1720	145	170	6.9			12					
29SEP62	220P	1700	8.7	22	99	79.7	1.1	10.1	14100	1467	20	7.0			14					
	Avg.	1905	7.6	25	94	77.9	1.9	20.2	3255	360	62	6.9			13		21	21		
	Max.	2310	8.7	29	100	94.6	2.7	33.6	14100	1467	200	7.2			14		21	21		
	Min.	1700	5.4	22	88	53.0	1.1	10.1	700	86	20	6.7			12		21	21		
	R	610	3.3	7	12	41.6	1.6	23.5	13400	1381	180	0.5			2		0	0		
	n	10	10	10	10	10	10	10	10	10	10	10			6		1	1		
P76																				
17SEP62	340P	2180	7.8	29	100	91.7	2.1	24.7	13000	1734	330	6.8			12	15	33	25		
18SEP62	923A	2250	7.2	24	88	87.3	1.6	19.4	13000	1790	330	6.8								
19SEP62	915A	2180	7.2	26	87	84.6	2.0	23.5	3300	440	220	6.8			12		27	24		
20SEP62	445P	2060	8.1	25	97	89.9	1.7	18.9	13000	1639	50	7.0			12					
21SEP62	900A	1940	7.4	23	86	77.4	1.5	15.7	2300	273	230	6.8			13					
22SEP62	930A	1820	7.7	22	88	75.5	1.6	15.7	3300	368	170	6.8			13					
	Avg.	2072	7.6	25	91	84.4	1.8	19.6	7983	1041	223	6.8			12	15	30	24		
	Max.	2250	8.1	29	100	91.7	2.1	24.7	13000	1790	330	7.0			13	15	33	25		
	Min.	1820	7.2	22	86	75.5	1.5	15.7	3300	273	50	6.8			12	15	27	24		
	R	430	0.9	7	14	16.2	0.6	9.0	9700	1517	280	0.2			1	0	6	1		
	n	6	6	6	6	6	6	6	6	6	6	6			5	1	2	2		
P74 - Richardson's Landing below Bogue Lusa Creek																				
11SEP62	1110A	2366	7.2	28	91	91.8	3.0	38.3	33000	4774	13000	7.1								
12SEP62	840A	2114	4.4	27	55	50.1	7.3	83.2	79000	10221	23000	6.7								
13SEP62	1045A	2054	4.7	28	59	52.0	5.4	59.8	33000	4148	33000	6.7								
	Avg.	2178	5.4	28	68	64.6	5.2	60.4	48300	6382	23000	6.8								
	Max.	2366	7.2	28	91	91.8	7.3	83.2	79000	10221	33000	7.1								
	Min.	2054	4.4	27	55	50.1	3.0	38.3	33000	4148	13000	6.7								
	R	312	2.8	1	36	41.7	4.3	44.9	46000	6073	20000	0.4								
	n	3	3	3	3	3	3	3	3	3	3	3								
P71																				
11SEP62	1130A	2366	5.0	27	62	63.8	6.0	76.5	109000	15783	49000	6.7								
13SEP62	1115A	2054	4.2	28	53	46.5	5.0	55.4	79000	9931	49000	6.7								
14SEP62	915A	1994	4.4	27	55	47.3	7.4	79.5	79000	9641	17200	6.9								
17SEP62	240P	2238	5.2	27	64	62.7	5.4	65.1	109000	14929	49000	7.0			20	18	32	40		
18SEP62	955A	2306	4.8	24	59	59.7			79000	11149	33000	6.9								
19SEP62	835A	2236	5.0	25	61	60.3	4.9	59.1	94000	12563	31000	6.8			18		29	37		
20SEP62	400P	2112	5.3	26	64	60.3			49000	6333	33000	6.7			19					
21SEP62	940A	1990	5.2	24	61	55.8	5.2	55.8				6.8			20					
22SEP62	840A	1868	5.4	22	61	54.4	4.6	46.3	130000	14862	79000	6.8			20					
24SEP62	345P	1868	6.4	24	75	64.4	6.2	62.4	130000	14862	49000	6.9			20					
25SEP62	915A	1866	5.8	23	67	58.3	5.5	55.3	240000	27409	33000	6.9			18					
26SEP62	1015A	1866	5.5	24	64	55.3	5.5	55.3	348000	39741	49000	6.8			18		26	36		
27SEP62	855A	1864	5.4	22	62	54.3	5.6	56.3	130000	14930	21200	6.8			19					
28SEP62	255P	1804	6.2	22	71	60.3	5.7	55.4	230000	25373	49000	6.8			17					
29SEP62	145P	1744	6.2	22	71	58.3	6.9	64.9	109000	11634	49000	6.8			20					
	Avg.	2012	5.3	25	63	57.4	5.7	60.6	137000	16383	42171	6.8			19	18	29	38		
	Max.	2366	6.4	28	75	64.4	7.4	79.5	348000	39741	79000	7.0			20	18	32	40		
	Min.	1744	4.2	22	53	46.5	4.6	46.3	49000	6333	17200	6.6			17	18	26	36		
	R	622	2.2	6	22	17.9	2.8	33.2	299000	33408	61800	0.4			3	0	6	4		
	n	15	15	15	15	15	13	13	14	14	14	15			11	1	3	3		

TABLE A-7 - LOWER PEARL RIVER

DATE	TIME	FLOW C.F.S.	D.O. mg/l	TEMP. °C	% SAT	D.O. 1000lbs/DA	B.O.D. mg/l	B.O.D. 1000lbs/DA	COLIFORM MPN/100ml	B.P.E.	E.COLI MPN/100ml	pH	SALINITY P.P.T.	C.O.D. mg/l	T. ALK. mg/l	HARDNESS mg/l	TURBID	COLOR	T.S.S. mg/l	V.S. mg/l
P64 - Above Pool's Bluff Sill																				
11SEP62	1155a	2366	4.6	27	55	56.1	4.6	58.7	330000	47734	33000	6.9								
12SEP62	755a	2114	3.6	27	45	41.0	4.4	50.1	79000	10221	23000	6.8								
13SEP62	1130a	2054	3.5	28	44	36.7	4.7	52.8	79000	9931	49000	6.6								
14SEP62	845a	1994	3.0	28	37	32.2	5.0	53.7	79000	9641	49000	6.5								
17SEP62	1215p	2230	3.7	29	48	44.6	4.7	56.7	130000	17906	33000				19	16	29	39		
18SEP62	1015a	2306	3.8	26	46	47.2	4.5	55.9	240000	33871	49000	6.6								
19SEP62	1006a	2236	4.0	26	49	48.2	3.7	44.6	43000	5884	31000	6.7			18		27	33		
20SEP62	1230p	2112	3.7	24	45	42.1	4.1	46.7	109000	14089	49000	6.7			22					
21SEP62	1000a	1990	4.3	24	46	42.9	3.7	39.7	79000	9621	33000	6.9			20					
22SEP62	1010a	1868	4.6	24	47	40.3	4.2	42.3	348000	39784	46000	6.7			20					
24SEP62	409p	1868	5.2	24	62	52.6	4.9	49.3	221000	25265	23000	6.6			19					
25SEP62	855a	1866	4.6	23	52	44.3	5.2	52.3	240000	27408	33000	6.6			20					
26SEP62	1035a	1866	4.4	24	48	41.2	4.6	46.3	230000	24246	130000	6.6			18		18	35		
27SEP62	625a	1864	3.9	22	44	39.2	4.6	46.2	130000	14430	49000	6.5			20					
28SEP62	315p	1804	4.8	23	55	46.7	4.5	41.8	172000	18990	79000	6.7			18					
29SEP62	1140a	1744	4.4	22	50	41.6	4.6	41.6	172000	18356	130000	6.6			19					
	Avg.	2018	4.0	25	48	43.8	4.5	48.7	167562	20609	[illegible]	6.7			19	16	25	36		
	Max.	2366	5.2	29	62	56.1	5.2	58.7	348000	47734	130000	6.9			22	16	29	39		
	Min.	1744	3.0	22	37	32.2	3.7	39.7	43000	5884	23000	6.5			18	16	18	33		
	R	622	2.2	7	25	23.9	1.5	19.0	305000	41850	107000	0.4			4	0	11	6		
	n	16	16	16	16	16	16	16	16	16	16	15			11	1	3	3		
P63-Below Pool's Bluff Sill																				
13SEP62	500p	2054	5.3	28	70	60.9	4.8	53.1	70000	8799	33000	6.7								
17SEP62	1140a	2230	4.9	29	63	59.1														
18SEP62	1045a	2306		24			4.6	51.2				6.7								
19SEP62	1310a	2236	5.6	26	66	61.5	3.7	44.6				6.7			18		25	34		
20SEP62	1150a	2112	5.1	26	62	59.1	3.9	44.6				6.6			17		21	38		
21SEP62	1010a	1990	5.6	24	66	60.1	3.8	40.8	109000	13275	79000	6.7			20					
22SEP62	1025a	1868	6.0	24	70	60.6	4.0	40.3				6.4			20					
24SEP62	415p	1864	6.6	24-	77	64.5	4.7	47.3				6.4			20					
25SEP62	845a	1866	6.3	23	73	67.5	5.2	52.3				6.6			19					
26SEP62	1050a	1866	6.0	24	71	62.3	5.4	54.3				6.6			19					
27SEP62	815a	1864	6.2	22	70	62.3	3.7	37.2				6.7			20					
28SEP62	325p	1804	6.6	23	75	64.2	4.2	40.8				6.7			18					
29SEP62	1110a	1744	6.4	22	72	60.2						6.8								
	Avg.	1986	5.9	25	70	61.9	4.4	46.6	89500	11037	56000	6.7			19		23	36		
	Max.	2306	6.6	29	77	67.5	5.4	57.2	109000	13275	79000	6.8			20		25	38		
	Min.	1744	4.9	22	62	58.1	3.7	37.2	70000	8799	33000	6.4			17		21	34		
	R	562	1.7	7	15	9.4	1.7	20.0	39000	4476	46000	0.4			3		4	4		
	n	13	12	13	12	12	11	11	2	2	2	12			9		2	2		

TABLE 1-8 - LOWER PEARL RIVER

DATE	TIME	FLOW C.F.S.	D.O. mg/l	TEMP. °C	% SAT	D.O. 1000lbs/DA	B.O.D. mg/l	B.O.D. 1000lbs/DA	COLIFORM MPN/100ml	B.P.E.	E.COLI MPN/100ml	pH	SALINITY P.P.T.	C.O.D. mg/l	T. ALK. mg/l	HARDNESS mg/l	TURBID	COLOR	T.S.S. mg/l	V.S. mg/l
										P60										
17SEP62	1130a	2238	4.9	29	63	59.2														
18SEP62	200p	2306	5.9	27	66	67.2														
20SEP62	1109a	2112	5.0	26	61	57.0														
21SEP62	140p	1990	5.6	25	66	60.2														
22SEP62	345p	1868	5.8	24	69	58.5														
24SEP62	900a	1868	6.1	23	70	61.5														
25SEP62	500p	1866	5.8	24	69	58.6														
26SEP62	135p	1866	6.1	24	72	61.5														
27SEP62	430p	1864	6.1	24	71	61.6														
28SEP62	845a	1804	5.8	22	65	56.5														
29SEP62	1055a	1744	6.3	22	71	59.3														
	Avg.	1957	5.7	25	68	60.1														
	Max.	2306	6.3	29	72	67.2														
	Min.	1744	4.9	22	61	56.5														
	R	562	1.4	7	11	10.7														
	n	11	11	11	11	11														
										P57										
17SEP62	1115a	2238	5.8	29	64	60.3	3.7	44.6	49000	6711	23000									
18SEP62	225p	2306	5.8	27	63	62.1	4.6	57.2	49000	6715	23000	[illegible]			21	16	26	40		
20SEP62	1055a	2112	5.0	26	61	56.0	2.9	33.0	79000	10711	4900	[illegible]			18					
21SEP62	230p	1990	5.8	25	69	62.2	3.1	33.3	79000	[illegible]	22100	[illegible]			22					
22SEP62	330p	1868	6.2	24	72	62.4	3.6	33.3	70000	[illegible]	33000	[illegible]			18					
24SEP62	925a	1868	5.8	23	67	54.6	3.9	59.4	70000	[illegible]	13000	[illegible]			19					
25SEP62	430p	1866	5.8	24	68	55.3			172000	17447	33000	[illegible]								
26SEP62	155p	1866	6.3	24	74	63.0	4.5	49.3	49000	5596	33000	[illegible]			17		17	40		
27SEP62	410p	1864	6.1	23	70	61.3	4.2	42.2	49000	5590	33000	[illegible]			17					
28SEP62	925a	1804	5.7	22	65	55.4	3.6	39.0	109000	17024	33000	[illegible]			18					
29SEP62	1025a	1744	6.0	22	66	56.6	4.4	41.6	221000	23588	46000	[illegible]			18					
	Avg.	1957	5.7	26	67	59.7	4.1	43.0	90545	10536	27000	6.7			19	16	22	40		
	Max.	2306	6.3	29	74	63.4	5.9	59.4	221000	23588	46000	6.8			22	16	26	40		
	Min.	1744	5.0	22	61	55.4	2.9	33.0	49000	5590	4900	6.6			17	16	17	40		
	R	562	1.3	7	13	8.0	3.0	26.4	172000	17998	41100	0.2			5	0	9	0		
	n	11	11	11	11	11	10	10	11	11	11	10			9	1	2	2		
										P53										
17SEP62	1045a	2238	5.2	29	56	50.8														
18SEP62	245p	2306	5.1	27	63	63.5														
21SEP62	225p	1990	5.6	25	67	60.2														
22SEP62	250p	1868	6.1	25	73	61.5														
24SEP62	945a	1868	5.6	23	64	56.5														
25SEP62	415p	1866	6.1	24	72	61.5														
26SEP62	210p	1866	6.2	24	73	62.3														
27SEP62	350p	1864	6.0	24	70	60.6														
28SEP62	925a	1804	5.6	22	64	54.6														
29SEP62	1005a	1744	6.0	22	69	56.5														
	Avg.	1941	5.6	24	67	58.8														
	Max.	2306	6.2	29	73	63.5														
	Min.	1744	5.1	22	56	50.8														
	R	562	1.1	7	17	12.7														
	n	10	10	10	10	10														

TABLE A-9 - LOWER PEARL RIVER

DATE	TIME	FLOW C.F.S.	D.O. mg/l	TEMP. °C	% SAT	D.O. 1000lbs/DA	B.O.D. mg/l	B.O.D. 1000lbs/DA	COLIFORM MPN/100ml	B.P.E.	E.COLI MPN/100ml	pH	SALINITY P.P.T.	C.O.D. mg/l	T. ALK. mg/l	HARDNESS mg/l	TURBID	COLOR	T.S.S. mg/l	V.S. mg/l
P50																				
17SEP62	1030a	2230	3.9	28	50	42.0	3.6	43.6	49000	6711	7900				23	18	28	43		
18SEP62	300p	2306	5.0	28	63	62.1	3.8	47.2	31000	4375	23000	6.7								
20SEP62	955a	2112	4.8	26	58	54.6	2.5	29.5	22100	2057	4900	6.7			16					
21SEP62	305p	1990	5.6	25	67	60.1	3.2	34.3	7900	962	1700	6.7			20					
22SEP62	210p	1866	5.9	24	73	59.4	3.2	32.2	49000	5602	6300	6.7			18					
24SEP62	1035a	1880	5.6	23	54	54.6	5.0	50.3	70000	4003	13000	6.6			20					
25SEP62	355p	1866	5.9	24	69	59.3			49000	5596	17200	6.8								
26SEP62	230p	1866	6.2	24	73	62.6	3.7	37.2	23000	2627	13000	6.6			16		20	37		
27SEP62	330p	1864	6.1	24	71	61.3	3.9	38.2	33000	3765	7900	6.7			18					
28SEP62	945a	1804	5.5	23	63	53.5	2.8	27.2	13000	1435	3300	6.7			18					
29SEP62	943a	1744	6.0	22	64	56.8	3.5	32.9	49000	5230	17200	6.5			17					
	Avg.	2057	5.5	25	65	57.5	3.5	37.1	36000	4488	10491	6.7			18	18	24	40		
	Max.	2306	6.2	28	73	62.4	5.0	51.3	70000	8003	23000	6.8			23	18	28	43		
	Min.	1744	3.9	22	50	47.0	2.5	27.2	7900	962	1700	6.5			16	18	20	37		
	R	562	2.3	6	23	15.4	2.5	23.1	62100	7041	21300	0.3			7	0	8	6		
	n	11	11	11	11	11	10	10	11	11	11	11			9	1	2	2		
P46																				
13SEP62	330p	2054	3.9	29	67	53.0	3.1	34.3	7900	993	1100	6.7								
17SEP62	1203a	2238	3.8	29	48	45.6	3.0	34.2							22	18	27	45		
18SEP62	330p	2308	5.0	27	63	62.2	3.0	37.3	13000	1836	4900	6.9								
20SEP62	935a	2112	5.1	26	62	59.1														
21SEP62	330p	1990	5.3	25	63	56.8														
22SEP62	140p	1868	5.8	24	68	59.4														
24SEP62	1235a	1868	5.4	23	62	54.6														
25SEP62	325p	1866	5.9	24	70	59.3														
26SEP62	250p	1866	5.8	24	68	59.3														
27SEP62	375p	1864	5.6	24	66	56.3														
28SEP62	1015a	1804	5.1	23	59	49.6														
29SEP62	915a	1744	5.4	22	61	50.8														
	Avg.	1965	5.3	25	63	55.8	3.0	35.9	10450	1414	3000	6.8			22	18	27	45		
	Max.	2306	5.9	29	70	62.2	3.1	37.3	13000	1835	4900	6.9			22	18	27	45		
	Min.	1744	3.8	22	48	45.8	3.0	34.6	7900	993	1100	6.7			22	18	27	45		
	R	562	2.1	6	22	16.4	0.1	3.7	5100	842	3800	0.2			0	0	0	0		
	n	12	12	12	12	12	3	3	2	2	2	2			1	1	1	1		
P42 - Lower Walkiah Bluff																				
12SEP62	1030a	2114	5.4	29	68	61.5	3.0	34.2	13000	1692	1300	6.5								
13SEP62	310p	2094	5.6	29	68	57.3	3.4	37.6	9400	1142	500	6.7								
17SEP62	915a	2238	4.1	29	53	49.5	3.3	39.8	46000	6300	10700									
18SEP62	400p	2306	5.8	26	71	62.1	2.9	36.0	14100	1990	2200	6.7			22	17	32	40		
20SEP62	900a	2112	5.3	26	66	60.3			13000	1690	2300	6.6			17					
21SEP62	355p	1990	5.9	25	70	61.3	2.5	26.8	2300	290	500	6.6			22					
22SEP62	110p	1868	6.1	24	72	61.6	2.9	29.2	24000	2744	4900	6.7			18					
24SEP62	1105a	1868	5.4	24	63	54.6	3.7	37.3	24000	2744	13000	6.7			19					
25SEP62	300p	1866	6.0	24	70	60.3			160000	10272	4600	6.7								
26SEP62	320p	1866	5.6	24	66	56.3	3.1	31.2	94200	4190	4900	6.7			18		20	38		
27SEP62	242p	1864	5.8	24	68	58.3	3.8	38.1	17200	1962	3300	6.6			17					
28SEP62	1045a	1804	5.3	23	61	51.5	2.6	25.3	22100	2440	3300	6.6		28.7	19					
29SEP62	830a	1744	5.6	22	61	50.8	2.4	22.6	23000	2455	7900	6.6		29.3	19					
	Avg.	1976	5.5	25	66	58.4	3.0	31.8	32485	3860	4608	6.7		29.0	19	17	26	39		
	Max.	2306	6.1	29	72	63.3	3.7	39.8	160000	10272	13000	6.8		29.3	22	17	32	40		
	Min.	1744	4.1	22	62	49.5	2.4	22.6	2300	290	500	6.6		28.7	17	17	20	38		
	R	562	2.0	7	10	13.8	1.3	17.2	157700	9982	12500	0.2		0.6	5	0	12	2		
	n	13	13	13	13	13	11	11	13	13	13	12		2	9	1	2	2		

TABLE A-10 - LOWER PEARL RIVER

DATE	TIME	FLOW C.F.S.	D.O. mg/l	TEMP. °C	% SAT	D.O. 1000lbs/DA	B.O.D. mg/l	B.O.D. 1000lbs/DA	COLIFORM MPN/100ml	B.P.E.	E.COLI MPN/100ml	pH	SALINITY P.P.T.	C.O.D. mg/l	T. ALK. mg/l	HARDNESS mg/l	TURBID	COLOR	T.S.S. mg/l	V.S. mg/l
EL3 - Foot bridge upstream from paper mill discharges, Bogalusa, La.																				
13SEP62	845A	42	7.4	25	88	1.7	2.5	0.6	7000	28	330	6.4								
14SEP62	1000A	41	7.4	26	90	1.6	2.0	0.4	13000	33	7900	6.5								
17SEP62	900A	46	7.2	24	85	1.8	2.6	0.6	7000	22	1720	6.6			7	6	8	40		
18SEP62	1045A	43	7.3	27	90	1.7	2.5	0.6	17200	45	440									
19SEP62	835A	44	6.8	25	81	1.6	1.3	0.3	4600	12	700				9		19	60		
20SEP62	230P	40	8.0	26	97	1.7	1.8	0.4	7000	17	940				8					
21SEP62	150P	38	8.0	25	96	1.6	2.4	0.5	7000	18	4900				9					
22SEP62	950A	36	7.5	24	88	1.5	1.2	0.2	7000	17	1720				10					
24SEP62	1055A	36	7.8	24	92	1.5	0.3	0.1	4900	11	330				7					
25SEP62	415P	34	8.6	25	103	1.6	0.7	0.1	7000	15	490				8					
26SEP62	210P	34	8.4	25	101	1.5	0.7	0.1	7900	16	1050				8		10	29		
27SEP62	835A	32	7.5	26	91	1.3	1.6	0.3	7000	14	2300				9					
28SEP62	520P	32	8.4	23	97	1.4	1.0	0.2	4900	10	1300	6.5			6					
29SEP62	1030A	31	7.8	22	88	1.3	0.8	0.1	27800	53	1750				14					
	Avg.	36	7.7	25	92	1.6	1.5	0.3	9493	22	1852	6.5			9	6	12	43		
	Max.	46	8.6	27	103	1.8	2.6	0.6	27800	53	7900	6.6			14	6	19	60		
	Min.	31	6.8	22	81	1.3	0.3	0.1	4600	10	330	6.4			6	6	8	29		
	R	15	1.8	5	22	0.5	2.3	0.5	23200	43	7570	0.2			8	0	11	31		
	n	14	14	14	14	14	14	14	14	14	14	4			11	1	3	3		
CZW - West sewer, Crown Zellerbach Corp.																				
17SEP62	925A	17	0.0	36	0	0.0	231.7	21.3	172000	179	49000	7.4			290	15	188	2000		
18SEP62	1120A	10	0.5	38	8	0.0	226.8	12.2	1600000	976	348000									
19SEP62	950A	14	2.0	40	30	0.1	184.8	14.0	172000	146	23000				152		140	525		
20SEP62	300P	13	0.0	39	0	0.0	234.7	16.7	330000	264	20000				219				192.0	124.0
21SEP62	200P	21	3.2	36	46	0.4	149.7	16.9	700000	903	33000				108					
22SEP62	1000A	19	1.2	37	17	0.1	166.5	17.1	1300000	1508	790000				84				172.0	164.0
24SEP62	1035A	29	0.0	40	0	0.0	283.5	44.5	79000	140	22000				434				128.0	116.0
25SEP62	430P	16	2.1	40	31	0.2	154.8	13.3	130000	127	7900				108				254.0	244.0
26SEP62	225P	6	1.6	40	23	0.1	178.0	5.7	542000	201	79000				155		165	750	138.0	134.0
27SEP62	855A	12	0.7	38	11	0.0	229.0	14.9	348000	254	130000	7.4			165					
28SEP62	530P	21	0.0	38	0	0.0	225.7	25.3	2210000	2851	70000				170					
29SEP62	935A	15	1.8	35	25	0.1	189.3	15.3	1300000	1196	49000				175					
	Avg.	16	1.1	38	16	0.1	204.9	18.1	740250	729	135075	7.4			187	15	164	1091	176.8	158.0
	Max.	29	3.2	40	46	0.4	283.5	44.5	2210000	2851	790000	7.4			434	15	188	2000	254.0	244.0
	Min.	6	0.0	35	0	0.0	149.7	5.7	79000	127	7900	7.4			84	15	140	525	128.0	116.0
	R	23	3.2	5	46	0.4	133.8	38.8	2131000	2724	782100	0.0			350	0	48	1475	126.0	128.0
	n	12	12	12	12	12	12	12	12	12	12	2			11	1	3	3	5	5
CZE - East sewer, Crown Zellerbach Corp.																				
17SEP62	940A	49	0.2	37	3	0.1	183.2	48.5	94000	282	22100	7.5			190	32	213	575		
18SEP62	1130A	26	0.0	38	0	0.0	189.2	26.5	1600000	2544	240000									
19SEP62	955A	25	0.0	39	0	0.0	213.3	28.8	130000	199	22100				245		240	900		
20SEP62	305P	20	3.0	39	45	0.3	125.3	13.5	2400000	2928	120000				153				118.0	100.0
21SEP62	210P	19	2.6	36	37	0.3	172.6	17.8	23000	27	2000				250				220.0	200.0
22SEP62	1010A	19	1.0	39	15	0.1	139.7	14.6	109000	126	7000				197				174.0	156.0
24SEP62	1040A	25	0.0	39	0	0.0	185.2	25.0	330000	505	26000				227					
25SEP62	440P	26	2.2	38	33	0.3	115.5	16.2	1720000	2735	120000				127					
26SEP62	235P	24	1.7	39	25	0.2	159.3	20.7	230000	338	22000				183		240	640		
27SEP62	910A	22	1.0	36	15	0.1	154.8	18.8				7.5			375					
28SEP62	540P	25	0.1	38	1	0.0	228.3	30.8	230000	352	9000				129					
29SEP62	945A	30	1.9	36	27	0.3	131.7	21.3	790000	1454	138000				126					
	Avg.	26	1.1	38	17	0.1	166.5	23.5	696000	1045	65500	7.5			204	32	231	705	170.6	152.0
	Max.	49	3.0	39	45	0.3	228.3	48.5	2400000	2928	240000	7.5			375	32	240	900	220.0	200.0
	Min.	19	0.0	36	0	0.0	115.5	13.5	23000	27	2000	7.5			126	32	213	575	118.0	100.0
	R	30	3.0	3	45	0.3	112.8	35.0	2377000	2901	238000	0.0			249	0	27	325	102.0	100.0
	n	12	12	12	12	12	12	12	11	11	11	2			11	1	3	3	3	3

TABLE A-11 - LOWER PEARL RIVER

DATE	TIME	FLOW C.F.S.	D.O. mg/l	TEMP °C	% SAT	D.O. 1000lbs/DA	B.O.D. mg/l	B.O.D. 1000lbs/DA	COLIFORM MPN/100ml	B.P.E.	E.COLI MPN/100ml	pH	SALINITY P.P.T.	C.O.D. mg/l	T. ALK. mg/l	HARDNESS mg/l	TURBID	COLOR	T.S.S. mg/l	V.S. mg/l
BL2 - Columbia St. bridge, Bogalusa, La.																				
13SEP62	905A	54	0.0	37	0	0.0	159.0	46.4	160000	528	160000	7.4								
14SEP62	1015A	53	1.6	36	23	0.5	161.2	46.1	330000	1069	80000	7.4								
17SEP62	845A	58	0.5	31	7	0.2	148.7	46.5	221000	785	33000	7.4			130	35	130	500		
18SEP62	1145A	55	0.8	33	11	0.2	160.7	47.7	2400000	8088	490000									
19SEP62	1000A	56	0.0	35	0	0.0	147.3	44.6	490000	1681	221000				183		165	360	122.0	98.0
20SEP62	315P	52	1.4	35	20	0.4	110.8	31.1	5420000	17236	1090000				121				82.0	62.0
21SEP62	230P	50	1.8	35	25	0.5	118.3	31.9	2210000	6763	790000				136				98.0	86.0
22SEP62	1025A	48	0.2	35	2	0.1	111.7	28.9	2300000	6762	790000				136				104.0	88.0
24SEP62	1105A	48	0.0	30	0	0.0	164.6	42.6	1090000	3205	110000				246				202.0	188.0
25SEP62	450P	46	0.1	34	1	0.0	130.9	32.5	2300000	6466	790000				114				82.9	63.7
26SEP62	245P	46	0.0	38	0	0.0	166.0	41.2	630000	1777	130000	7.5			103		210	1000	116.0	100.0
27SEP62	930A	44	0.0	35	0	0.0	135.2	32.2	2400000	6456	1300000				191					
28SEP62	555P	44	0.0	35	0	0.0	206.0	49.0	3480000	9361	1720000				129				122.0	110.0
29SEP62	1000A	43	0.6	35	8	0.0	125.6	29.1	2400000	6312	230000				140				116.0	97.9
	Avg.	50	0.5	35	7	0.1	145.2	39.3	1845070	5465	566714	7.4			156	35	168	620	115.4	99.5
	Max.	58	1.8	38	25	0.5	206.0	49.0	5420000	17236	1720000	7.5			246	35	210	1000	202.0	188.0
	Min.	43	0.0	31	0	0.0	110.8	28.9	160000	528	33000	7.4			114	35	130	360	82.0	62.0
	R	15	1.8	7	25	0.5	95.2	20.1	5260000	16708	1687000	0.1			132	0	80	640	120.0	126.0
	n	14	14	14	14	14	14	14	14	14	14	14			11	1	3	3	9	9
BLO - Mouth of Bogue Lusa Creek																				
13SEP62	1030A	56	1.5	30	19	0.4	41.1	12.5	4900000	16807	700000	6.9								
14SEP62	945A	56	0.0	33	0	0.0	185.8	54.3	3300000	10890	1090000	7.5								
17SEP62	305P	58	0.0	30	0	0.0	96.0	30.0	3300000	11715	700000	7.5			113	38	130	300		
18SEP62	940A	56	0.0	29	0	0.0	138.7	41.9	1300000	4459	4900000	7.6								
19SEP62	845A	56	0.0	31	0	0.0	164.8	49.8	4900000	16007	4900000	7.0			200		213	360	100.0	73.3
20SEP62	415P	52	0.0	31	0	0.0	162.8	45.7	7000000	22260	2300000	7.4			222				114.0	91.0
21SEP62	913A	50		29			111.0	30.0	4900000	14994	3300000	7.2			192				86.7	63.3
22SEP62	900A	48	0.0	27	0	0.0	111.9	29.0	3300000	9702	2300000	7.2			169				60.0	60.0
24SEP62	330P	48	0.0	32	0	0.0	166.7	43.2	3300000	9702	1090000	7.1			237				87.5	61.5
25SEP62	930A	46	0.0	30	0	0.0	134.7	33.4	4900000	13018	790000	7.3			188				72.0	54.0
26SEP62	1000A	46	0.0	30	0	0.0	154.6	38.3	3300000	9306	790000	7.8			248		200	1200	87.5	70.0
27SEP62	913A	44	0.0	30	0	0.0	93.0	22.1	3300000	8877	330000	7.2			167				136.0	100.0
28SEP62	245P	44	0.0	31	0	0.0	112.7	26.8	17200000	46268	4900000	7.0			160				76.7	63.3
29SEP62	155P	44	0.0	31	0	0.0	93.7	22.3	4900000	13181	2210000	7.2			174				73.3	70.0
	Avg.	50	0.1	30	1	0.0	126.3	34.2	4905714	14913	1849286	7.3			192	38	181	620	89.4	71.2
	Max.	58	1.5	33	19	0.4	185.8	54.3	17200000	46268	4900000	7.8			248	38	213	1200	136.0	100.0
	Min.	44	0.0	27	0	0.0	41.1	12.5	1300000	4459	330000	6.9			113	38	130	300	60.0	54.0
	R	14	1.5	6	19	0.4	144.7	41.8	15900000	41809	4570000	0.9			135	0	83	900	76.0	46.0
	n	14	14	14	13	13	14	14	14	14	14	14			11	1	3	3	10	10
CCO - Mouth of Coburn Creek																				
14SEP62	1000A		0.0	27	0		78.3		170000		50000	7.0							32.0	21.0
17SEP62	330P		0.0	28	0		30.0		490000		109000	7.2			62	31	71	125		
18SEP62	930A		0.0	24	0		48.8		230000		49000	7.0								
19SEP62	900A		0.0	24	0		46.3		1300000		221000	6.9			63		70	130	48.0	25.0
20SEP62	430P		0.0	25	0		73.6		1090000		94000	7.0			81				34.0	17.0
21SEP62	909A		0.0	22	0		29.3		790000		490000	6.8			71				34.0	19.0
22SEP62	920A		0.0	23	0		47.9		490000		79000	6.9			70				29.0	16.0
24SEP62	315P		0.0	24	0		47.3		330000		49000	6.9			67				33.0	17.0
25SEP62	940A		0.0	22	0		33.1		1720000		230000	6.8			64				34.0	19.0
26SEP62	945A		0.0	23	0		36.1		790000		230000	6.8			68		73	125	35.0	20.0
27SEP62	930A		0.0	22	0		38.9		490000		79000	6.7			71					
28SEP62	230P		0.0	24	0		36.0		1300000		230000	6.6			59				43.0	24.0
29SEP62	210P		0.0	23	0		15.7		790000		130000	6.7			64				32.0	20.0
	Avg.		0.0	24	0		42.7		707692		156923	6.9			67	31	71	127	35.9	19.8
	Max.		0.0	28	0		78.3		1720000		490000	7.2			81	31	73	130	48.0	25.0
	Min.		0.0	22	0		15.7		170000		49000	6.6			59	31	70	125	29.0	16.0
	R		0.0	6	0		62.6		1550000		441000	0.6			22	0	3	5	19.0	9.0
	n		13	13	13		13		13		13	13			11	1	3	3	10	10

TABLE A-12 - LOWER PEARL RIVER

DATE	TIME	FLOW C.F.S.	D.O. mg/l	TEMP. °C	% SAT	D.O. 1000lbs/DA	B.O.D. mg/l	B.O.D. 1000lbs/DA	COLIFORM MPN/100ml	B.P.E.	E.COLI MPN/100ml	pH	SALINITY P.P.T.	C.O.D. mg/l	T. ALK. mg/l	HARDNESS mg/l	TURBID	COLOR	T.S.S. mg/l	V.S. mg/l
BC1 - Bogue Chitto Creek																				
11SEP62	419P	890	7.4	28	94	35.5	1.4	6.7	1090	59	70									
12SEP62	115P	872	7.4	28	94	34.8			1300	69	110	6.7								
14SEP62	335P	870	7.4	30	96	34.7	0.8	3.8	1090	58	50	6.7								
	Avg.	880	7.4	29	95	35.0	1.1	5.2	1160	62	77	6.7								
	Max.	890	7.4	30	96	35.5	1.4	6.7	1300	69	110	6.7								
	Min.	870	7.4	28	94	34.7	0.8	3.8	1090	58	50	6.7								
	R	20	0	2	2	0.8	0.6	2.9	210	11	60	0								
	n	3	3	3	3	3	2	2	3	3	3	2								
WP22 - Old U. S. 11 drawbridge over West Pearl River																				
12SEP62	1050P	3370	6.7	30	88	121.7	1.7	30.8	4000	825	2000									
13SEP62	1215P	3210	6.7	29	86	115.8	1.9	32.8	1720	338	490	6.7								
14SEP62	135P	3100	6.7	30	88	112.0	1.9	31.7	1090	207	230	6.7								
17SEP62	205P	2940	7.4	30	94	114.1	2.0	31.7	3450	621	1300	6.7			16	18	27	40		
18SEP62	350P	3080	6.6	29	88	102.9	2.2	36.5	4900	924	490	6.7								
19SEP62	1035P	3200	6.6	29	81	110.6	1.8	31.0	790	155	490	6.9			19		26	38		
20SEP62	945A	3240	6.2	22	71	104.3	1.5	26.2	13000	2576	230	6.7			18					
21SEP62	855A	3110	6.7	25	80	112.3	1.4	23.5	3300	628	170	6.8			16					
22SEP62	1025A	3010	6.6	25	82	110.3	1.7	27.6	2300	424	170	6.7			16					
24SEP62	1225P	2710	7.1	25	85	103.7	1.9	27.9	3300	547	1720	6.7			16					
25SEP62	930A	2830	6.9	25	92	105.3	1.7	25.9	4000	844	270	6.9			17					
26SEP62	110P	2770	6.6	26	93	101.5	1.7	25.6	22100	3746	700	6.9			18		21	30		
27SEP62	135P	2540	7.2	26	86	94.6	2.2	30.1	7000	1098	1090	6.9			16					
28SEP62	435P	2440	7.0	24	88	91.3	2.0	26.3	4900	732	490	6.5			15					
29SEP62	910A	2370	6.7	24	78	85.6	1.9	24.3	1790	254	630	6.7		46.5	16					
	Avg.	2928	6.8	27	83	106.7	1.8	28.8	5233	988	698	6.8		46.5	17	18	25	36		
	Max.	3370	7.4	30	94	121.7	2.2	36.5	22100	3746	2000	6.9		46.5	19	18	27	40		
	Min.	2370	6.2	22	71	85.6	1.4	23.5	790	155	170	6.5		46.5	15	18	21	30		
	R	1000	1.2	8	23	36.1	0.8	13.0	21310	3591	1830	0.4		0	4	0	6	10		
	n	15	15	15	15	15	15	15	15	15	15	14		1	11	1	3	3		

TABLE A-13 - LOWER PEARL RIVER

DATE	TIME	FLOW C.F.S.	D.O. mg/l	TEMP. °C	% SAT	D.O. 1000lbs/DA	B.O.D. mg/l	B.O.D. 1000lbs/DA	COLIFORM MPN/100ml	B.P.E.	E.COLI MPN/100ml	pH	SALINITY P.P.T.	C.O.D. mg/l	T. ALK. mg/l	HARDNESS mg/l	TURBID	COLOR	T.S.S. mg/l	V.S. mg/l
WPIT - U. S. 90 bridge (surface sample)																				
11SEP62	1000A		6.2	28	78		2.2		330		230	6.9								
12SEP62	806A		6.2	28	79		1.8		2300		110	6.7								
13SEP62	845P		6.8	28	87		2.4		2300		790	5.8								
17SEP62	1210P		6.7	30	87		2.2		1300		230	6.9			18	18	25	47		
18SEP62	135P		7.1	30	92		2.0		7900		80	6.8								
19SEP62	350P		6.9	29	89		1.6		4600		330	6.8			20		32	39		
20SEP62	530P		6.9	28	87		1.5		4900		230	6.7			17					
21SEP62	700P		6.9	26	84		1.4		2700		140				16					
22SEP62	815P		6.9	26	83		1.8		1300		490	6.5			16					
24SEP62	925P		7.3	26	88		1.7		4600		50	6.5			15					
25SEP62	1010P		7.0	26	85		1.5		7000		130	6.6			16					
26SEP62	1040P		6.6	25	79		2.5		940		130	6.6			16		20	41		
27SEP62	235P		7.2	26	88		2.3		3300		170	6.9			16					
28SEP62	920A		6.7	24	78		1.8		3300		170	6.9		10.5	17					
29SEP62	910A		7.0	24	83		1.8		4900		790	6.5		68.0	16					
	Avg.		6.8	27	85		1.9		3450		271	6.7		39.2	17	18	26	42		
	Max.		7.3	30	92		2.5		7900		790	6.9		68.0	20	18	32	47		
	Min.		6.2	24	78		1.4		330		50	5.8		10.5	15	18	20	39		
	R		1.1	6	14		1.1		7570		740	1.1		57.5	5	0	12	8		
	n		15	15	15		15		15		15	14		2	11	1	3	3		
WPIB - U. S. 90 bridge (bottom sample)																				
11SEP62	1015A		6.5	28	82		1.8		4900		460	6.7								
12SEP62	749A		6.2	28	78		1.3		1300		50	6.7								
17SEP62	1145A		6.7	30	87		0.5		3900		90	6.7			17	16	27	42		
18SEP62	125P		6.7	30	89		1.2		1300		170	6.7								
19SEP62	330P		6.9	30	90		0.4		9400		790	6.9			19		33	41		
20SEP62	520P		7.0	28	88		0.6		1610		310	6.7			19					
21SEP62	700P		6.9	26	84		0.5		4900		230				16					
22SEP62	815P		6.6	26	80		0.6		4600		130	6.5			15					
24SEP62	910P		7.2	25	86		0.9		7000		110	6.6			14					
25SEP62	953P		6.9	26	83		0.6		10900		130	6.7			16					
26SEP62	1020P		6.8	25	82		0.7		2210		70	6.6			16			47		
27SEP62	225P		7.4	26	90		0.7		1300		170	7.0			16					
28SEP62	900A		6.6	24	77		0.6		3100		330	6.7		11.7	18					
29SEP62	900A		6.9	24	82		0.6		1720		330	6.7		58.7	16					
	Avg.		6.8	27	84		0.8		4096		241	6.7		35.2	17	16	30	43		
	Max.		7.4	30	90		1.8		10900		790	7.0		58.7	19	16	33	47		
	Min.		6.2	24	77		0.4		1300		50	6.5		11.7	14	16	27	41		
	R		1.2	6	13		1.4		9600		740	0.5		47.0	5	0	6	6		
	n		14	14	14		14		14		14	13		2	11	1	2	3		

TABLE A-15 - LOWER PEARL RIVER

DATE	TIME	FLOW C.F.S.	D.O. mg/l	TEMP. °C	% SAT	D.O. 1000lbs/DA	B.O.D. mg/l	B.O.D. 1000lbs/DA	COLIFORM MPN/100ml	B.P.E.	E.COLI MPN/100ml	pH	SALINITY P.P.T.	C.O.D. mg/l	T. ALK. mg/l	HARDNESS mg/l	TURBID	COLOR	T.S.S. mg/l	V.S. mg/l
[illegible] - U. S. 90 bridge (surface sample)																				
11SEP62	1035a		6.6	28	86		1.9		4980		170	6.7	4.5							
12SEP62	840a		5.9	28	78		1.4		2700		220	6.6	4.2							
13SEP62	825p		5.2	28	68		1.8		7900		330	5.4	3.5							
	Avg.		5.9	28	77		1.7		5193		240	6.2	4.1							
	Max.		6.6	28	86		1.9		7900		330	6.7	4.5							
	Min.		5.2	28	68		1.4		2700		170	5.4	3.5							
	R		1.4	0	18		0.5		5200		160	1.3	1.0							
	n		3	3	3		3		3		3	3	3							
[illegible] - U. S. 90 bridge (bottom sample)																				
11SEP62	1050a		1.8	28	25		1.5		7000		230	6.9	12.6							
12SEP62	825a		0.9	29	12		1.5		50		20	6.7	11.2							
13SEP62	825p		0.8	28	12		0.6		310		20	5.6	14.1							
	Avg.		1.2	28	16		1.2		2453		90	6.4	12.6							
	Max.		1.8	29	25		1.5		7000		230	6.9	14.1							
	Min.		0.8	28	12		0.6		50		20	5.6	11.2							
	R		1.0	1	13		0.9		6950		210	1.3	2.9							
	n		3	3	3		3		3		3	3	3							
[illegible] - U. S. 90 bridge (surface sample)																				
11SEP62	1120a		6.9	29	91		2.0		7000		490	6.8	4.8							
12SEP62	915a		6.1	29	80		1.5		10400		330	6.7	3.8							
13SEP62	805p		5.0	29	67		1.9		17700		790	6.0	6.2							
	Avg.		6.0	29	79		1.8		11700		537	6.5	4.9							
	Max.		6.9	29	91		2.0		17700		790	6.8	6.2							
	Min.		5.0	29	67		1.5		7000		330	6.0	3.8							
	R		1.9	0	24		0.5		10800		460	0.8	2.4							
	n		3	3	3		3		3		3	3	3							
[illegible] - U. S. 90 bridge (bottom sample)																				
11SEP62	1105a		1.9	28	27		1.6		7900		170	6.9	13.9							
12SEP62	900a		0.6	29	8		1.6		1090		20	6.9	9.6							
13SEP62	805p		2.6	28	36		1.4		700		40	5.4	12.8							
	Avg.		1.7	28	24		1.5		3230		77	6.4	12.1							
	Max.		2.6	29	36		1.6		7900		170	6.9	13.9							
	Min.		0.6	28	8		1.4		700		20	5.4	9.6							
	R		2.0	1	28		0.2		7200		150	1.5	4.3							
	n		3	3	3		3		3		3	3	3							
[illegible] - U. S. 90 bridge (top sample)																				
11SEP62	1130a		7.0	30	95		2.2		7000		490	7.0	4.8							
12SEP62	1000a		5.8	30	79		2.2		13000		230	6.7	7.9							
13SEP62	745p		5.6	29	75		2.1		24000		790	5.8	7.5							
	Avg.		6.1	30	83		2.2		14667		503	6.5	6.7							
	Max.		7.0	30	95		2.2		24000		790	7.0	7.9							
	Min.		5.6	29	75		2.1		7000		230	5.8	4.8							
	R		1.4	1	20		0.1		17000		560	1.2	3.1							
	n		3	3	3		3		3		3	3	3							
[illegible] - U. S. 90 bridge (bottom sample)																				
11SEP62	1140a		4.0	30	57		3.1		1720		130	7.1	16.1							
12SEP62	940a		2.1	30	30		1.3		490		80	6.9	14.9							
13SEP62	745p		2.8	30	42		1.0		460		50	5.4	24.8							
	Avg.		3.0	30	43		1.8		890		87	6.5	18.6							
	Max.		4.0	30	57		3.1		1720		130	7.1	24.8							
	Min.		2.1	30	30		1.0		460		50	5.4	14.9							
	R		1.9	0	27		2.1		1260		80	1.7	9.9							
	n		3	3	3		3		3		3	3	3							

TABLE A-15 - EAST PEARL RIVER

DATE	TIME	FLOW C.F.S.	D.O. mg/l	TEMP. °C	% SAT	D.O. 1000lbs/DA	B.O.D. mg/l	B.O.D. 1000lbs/DA	COLIFORM MPN/100ml	B.P.E.	E.COLI MPN/100ml	pH	SALINITY P.P.T.	C.O.D. mg/l	T. ALK. mg/l	HARDNESS mg/l	TURBID	COLOR	T.S.S. mg/l	V.S. mg/l
E16 - Bridge on road to Union Baptist Church, E. of Caesar, Miss.																				
12SEP62	1050A		7.2	27	90		0.9		13000		200									
13SEP62	1105A		7.3	26	89		1.1		10900		200	6.6								
14SEP62	1215P		7.5	28	94		1.2		7000		170	6.7								
17SEP62	740A		6.8	26	82		1.0		4900		630	6.5			6	10	10	34		
18SEP62	905A		6.7	26	81		0.8					6.5								
19SEP62	910A		7.1	25	85		0.9		7900		330	6.7			8		10	29		
	Avg.		7.1	26	87		1.0		8740		306	6.6			7	10	10	32		
	Max.		7.5	28	94		1.2		13000		630	6.7			8	10	10	34		
	Min.		6.7	25	81		0.8		4900		170	6.5			6	10	10	29		
	R		0.8	3	13		0.4		8100		460	0.2			2	0	0	5		
	n		6	6	6		6		5		5	5			2	1	2	2		
E7 - Beech Road bridge, Picayune, Miss.																				
12SEP62	1020A	78	6.1	27	76	2.6	1.4	0.6	2000	10	2000									
13SEP62	1039A	82	5.8	27	72	2.6	1.4	0.6	7900	40	330	6.5								
14SEP62	1140A	78	5.7	27	71	2.4	1.5	0.6	4900	23	490	6.5								
17SEP62	709A	71	5.4	26	65	2.1	1.4	0.5	34200	236	34200	6.6			13	6	29	60		
18SEP62	830A	73	5.4	26	66	2.2	1.3	0.5	4600	21	800	6.6								
19SEP62	840A	92	5.9	26	72	2.9	1.0	0.5	2400	15	200	6.7			16		11	52		
20SEP62	1109A	88	5.8	26	69	2.5	0.9	0.4	4900	24	200	6.6			16					
21SEP62	1029A	70	6.0	24	71	2.3	0.6	0.2	2200	9	200	6.7			18					
22SEP62	835A	65	6.4	23	74	2.2	0.8	0.3	1700	7	200	6.5			18					
24SEP62	1045A	65	6.5	23	75	2.3	1.1	0.4	700	3	230	6.7			17					
25SEP62	1109A	62	6.4	24	74	2.1	1.0	0.3	790	3	170	6.5			14					
26SEP62	1113A	62	6.5	24	76	2.2	1.3	0.4	1920	7	130	6.6			16		11	44		
27SEP62	1120A	57	6.3	24	73	1.9	1.4	0.4	700	2	170	6.7		29.2	16					
27SEP62	715P	57	6.6	26	80	2.0						6.2								
28SEP62	635A	57	6.6	22	75	2.0	0.8	0.2	2780	10	310	6.5		31.3	17					
28SEP62	155P	57	6.2	25	75	1.9								16.9						
28SEP62	440P	57	6.5	23	75	2.0						6.7		41.2						
28SEP62	1153P	57	6.5	23	75	2.0						6.5		26.1						
29SEP62	620A	54		22			1.0	0.3	2210	7	170	6.6		41.6	17					
29SEP62	115P	54	7.0	22	79	2.2						6.6		12.7						
29SEP62	615P	54		24								6.5		47.0						
30SEP62	1240A	52	6.5	21	72	1.8								13.0						
30SEP62	615A	52	6.6	22	75	1.8	1.0	0.3	790	3	110	6.6		22.9						
30SEP62	1213P	52	6.7	22	77	1.9						6.7								
30SEP62	620P	52	7.0	22	79	2.0						6.6								
30SEP62	1155P	52	6.9	22	78	1.9						6.6		30.7						
1OCT62	635A	72	6.9	22	78	2.7	1.5	0.6	1300	6	130	6.5		21.5						
1OCT62	350P	72	6.7	23	77	2.6								13.0						
2OCT62	1215A	72	6.9	23	79	2.7						6.6		16.8						
2OCT62	615A	72	7.3	22	83	2.8	0.7	0.3	10400	48	490	6.6		12.3						
	Avg.	64	6.4	24	73	2.2	1.1	0.4	5938	26	3363	6.6		25.9	16	6	17	52		
	Max.	92	7.3	27	83	2.9	1.5	0.6	34200	236	34200	6.7		47.0	18	6	29	60		
	Min.	52	5.4	21	65	1.8	0.6	0.2	700	2	110	6.2		12.7	13	6	11	44		
	R	40	1.9	6	18	1.1	0.9	0.4	33500	234	34090	0.5		34.3	5	0	18	16		
	n	30	28	30	28	28	18	18	18	18	18	26		15	11	1	3	3		

TABLE A-16 - EAST PEARL RIVER

DATE	TIME	FLOW C.F.S.	D.O. mg/l	TEMP. °C	% SAT	D.O. 1000lbs/DA	B.O.D. mg/l	B.O.D. 1000lbs/DA	COLIFORM MPN/100ml	B.P.E.	E.COLI MPN/100ml	pH	SALINITY P.P.T.	C.O.D. mg/l	T. ALK. mg/l	HARDNESS mg/l	TURBID	COLOR	T.S.S. mg/l	V.S. mg/l
EP4 - Burnt bridge W. of Picayune, Miss. on Palestine Road																				
12SEP62	1030a	78	3.6	27	45	1.5	3.6	1.6	3300	16	500									
13SEP62	1010a	82	3.2	27	40	1.4	3.5	1.5	17200	86	200	6.5								
14SEP62	1115a	78	3.7	27	46	1.6	1.8	0.8	7900	38	2300	6.5								
17SEP62	645a	71	3.2	26	40	1.2	2.6	1.0	13000	56	790	6.5				8	15	50		
18SEP62	810a	75	1.6	26	19	0.6	3.9	1.6	17200	79	10900	6.5								
19SEP62	820a	92	2.0	26	24	1.0	5.0	2.5	10900	61	330	6.5			29		10	60		
20SEP62	1150a	80	1.8	26	23	0.8	3.9	1.7	10900	53	490	6.4			30					
21SEP62	1045a	70	1.8	25	21	0.7	5.1	1.9	7000	30	490	6.5			33					
22SEP62	855a	65	1.8	24	22	0.6	5.6	2.0	3300	13	220	6.5			36					
24SEP62	1025a	65	2.2	24	26	0.8	6.0	2.1	1750	7	330	6.7			35					
25SEP62	1125a	62	2.1	24	25	0.7	4.1	1.6	3300	13	330	6.6			35					
	Avg.	74	2.5	26	30	1.0	4.1	1.6	8705	41	1530	6.5			33	8	12	55		
	Max.	92	3.7	27	46	1.6	6.0	2.5	17200	86	10900	6.7			36	8	15	60		
	Min.	62	1.6	24	19	0.6	1.8	0.8	1750	7	220	6.4			29	8	10	50		
	R	30	2.1	3	27	1.0	4.2	1.7	15450	79	10680	0.3			7	0	5	10		
	n	11	11	11	11	11	11	11	11	11	11	10			6	1	2	2		
26SEP62	1045a	62	0.1	25	1	0.0	25.8	8.6	160000	607	4900	6.7			53			75		
27SEP62	1050a	57	1.3	25	16	0.4	26.8	8.1	54200	189	4900	6.7		739	39					
27SEP62	735p	57	1.6	24	20	0.5						6.0								
28SEP62	600a	57	2.4	23	27	0.7	8.1	2.5	24000	84	790	6.6		1710	33					
28SEP62	135p	57	2.3	26	30	0.8								285						
28SEP62	420p	57	2.8	24	33	0.9						6.5		272						
28SEP62	1120p	57	2.4	24	28	0.7								191						
29SEP62	550a	54	2.3	22	26	0.7	5.2	1.5	4900	16	490	6.7		238	34					
29SEP62	1255p	54	2.5	23	29	0.7						6.5		230						
29SEP62	600p	54	3.2	24	37	0.8						6.4		516						
30SEP62	1205a	52	3.1	22	35	0.9						6.4		259						
30SEP62	550a	52	3.1	22	35	0.9	3.1	0.9	7000	22	490	6.5		316						
30SEP62	1150a	52	3.6	24	42	1.0						6.6		296						
30SEP62	600p	52	3.6	23	41	1.0						6.4		238						
30SEP62	1130p	52	3.2	22	36	0.9						6.4		368						
1OCT62	605a	72	3.0	23	35	1.2	2.8	1.1	790	3	130	6.5		395						
1OCT62	335p	72	3.2	24	38	1.2								196						
1OCT62	1150p	72	4.2	23	48	1.6						6.5		226						
2OCT62	600a	72	3.1	22	35	1.2	4.2	1.6	7900	35	3300	6.4		346						
EP32 - Log bridge at Jackson's Landing, W. of Nicholson, Miss.																				
20SEP62	1045a	130	3.4	26	42	2.5	2.8	1.8	13000	110	330	6.7			25					
21SEP62	1000a	131	4.2	24	50	3.0	2.2	2.3	10900	97	490	6.6			26					
22SEP62	925a	128	4.2	24	49	2.9	2.3	1.6	4900	38	330	6.7			26					
24SEP62	1115a	122	3.8	24	45	2.5	3.9	2.6	3300	25	220	6.6			28					
25SEP62	1015a	121	3.7	24	44	2.4	2.6	1.6	4600	34	170	6.6			28					
26SEP62	1200a	120	4.1	25	49	2.7	2.2	1.4	1300	10	90	6.6			29			48		
	Avg.	127	3.9	24	46	2.7	2.7	1.8	6333	51	272	6.6			27			48		
	Max.	130	4.2	26	50	3.0	3.9	2.6	13000	110	490	6.7			29			48		
	Min.	120	3.4	24	42	2.4	2.2	1.4	1300	10	90	6.6			25			48		
	R	10	0.8	2	8	0.6	1.7	1.2	11700	100	400	0.1			4			0		
	n	6	6	6	6	6	6	6	6	6	6	6			6			1		
27SEP62	1155a	118	0.6	24	7	0.4	27.3	17.6	160000	1155	7900	6.7		1050	39					
27SEP62	640p	118	0.7	25	9	0.4						6.1								
28SEP62	710a	118	0.1	22	1	0.1	24.7	15.7	17200	124	4900	6.5		894	37					
28SEP62	225p	118	1.3	26	15	0.8								505						
28SEP62	510p	118	2.0	24	26	1.3						6.7		470						
29SEP62	1230a	118	2.8	23	32	1.8								202						
29SEP62	650a	118	3.2	22	35	2.0	3.8	2.6	3300	24	490	6.5		772	27					
29SEP62	135p	118	4.5	23	52	2.9						6.6		139						
29SEP62	730p	118	4.6	24	54	2.9						6.6		628						
30SEP62	120a	121	4.5	22	51	2.8						6.6								
30SEP62	700a	121	4.4	22	50	2.9	2.7	1.8	330	2	130	6.6		270						
30SEP62	1240p	121	5.2	24	62	3.4						6.5								
30SEP62	655p	121	5.6	23	65	3.7						6.4		198						
1OCT62	1220a	133	5.3	22	60	3.8						6.6		266						
1OCT62	705a	133	5.8	24	58	3.6	2.5	1.8	7000	57	400	6.7								
1OCT62	435p	133	6.0	24	70	4.3								176						
2OCT62	1245a	133	5.7	23	66	4.1						6.5		285						
2OCT62	700a	133	5.2	24	61	3.7	2.0	1.4	17200	140	1000	6.6		218						

TABLE A-17 - EAST PEARL RIVER

EP25 - New U. S. 11 bridge over East Pearl River, S. of Nicholson, Miss.

DATE	TIME	FLOW C.F.S.	D.O. mg/l	TEMP. °C	% SAT	D.O. 1000lbs/DA	B.O.D. mg/l	B.O.D. 1000lbs/DA	COLIFORM MPN/100ml	B.P.E.	E.COLI MPN/100ml	pH	SALINITY P.P.T.	C.O.D. mg/l	T. ALK. mg/l	HARDNESS mg/l	TURBID	COLOR	T.S.S. mg/l	V.S. mg/l
12SEP62	150P	171	5.2	29	67	4.5	1.9	1.9	49000	513	8000									
13SEP62	1245P	154	4.6	29	59	3.6	2.6	2.3	49000	462	13000	6.6								
14SEP62	1255P	139	5.0	29	63	3.7	3.0	2.2	49000	417	10900	6.5								
17SEP62	305P	159	4.7	25	60	4.0	3.2	2.7	542000	5274	13000	6.6			25	10	12	54		
18SEP62	305P	152	6.0	24	76	4.9	2.2	1.6	109000	1014	3300	6.5								
19SEP62	950A	147	4.1	26	50	3.2	2.2	1.7	49000	441	7900	6.7			28		13	64		
20SEP62	1000A	141	4.0	25	48	3.0	2.8	2.1	221000	1907	49000	6.7			26					
21SEP62	915A	134	3.5	24	41	2.5	2.6	1.9	79000	648	23000	6.6			27					
22SEP62	950A	131	3.3	24	39	2.3	3.0	2.1	79000	633	79000	6.5			28					
24SEP62	1140A	124	2.8	24	33	1.9	3.1	2.1	23000	175	23000	6.5			29					
25SEP62	1010A	123	2.6	24	30	1.7	3.1	2.1	70000	527	23000	6.7			28					
26SEP62	1220P	122	3.1	26	38	2.0	3.1	2.0	130000	971	49000	6.7			32		20	50		
	Avg.	141	4.1	25	50	3.2	2.8	2.1	120750	1082	25175	6.6			28	10	15	56		
	Max.	171	6.0	29	76	4.9	3.1	2.7	542000	5274	79000	6.7			32	10	20	64		
	Min.	122	2.6	24	30	1.7	1.9	1.7	23000	175	3300	6.5			25	10	12	50		
	R	49	3.4	5	46	3.2	1.2	1.0	519000	5099	75700	2			7	0	8	14		
	n	12	12	12	12	12	12	12	12	12	12	11			8	1	3	3		
27SEP62	1225P	120	0.8	24	9	0.5	7.4	4.8	130000	955	33300	6.5		42.0	32					
27SEP62	320P	120	0.2	26	2	0.1						6.6								
28SEP62	740A	120	0.0	23	0	0.0	23.7	15.3	348000	2556	100000	6.7		91.0	40					
28SEP62	325P	120		26																
28SEP62	530P	120	0.4	24	4	0.3						6.5		36.8						
29SEP62	100A	120	0.2	24	3	0.1								73.0						
29SEP62	720A	120	0.2	22	2	0.1	15.3	9.9	542000	3990	130000			71.0	36					
29SEP62	200P	120	0.8	23	9	0.5						6.5		6.0						
29SEP62	750P	120	3.5	24	41	2.3						6.7		73.0						
30SEP62	220A	123	4.0	22	45	2.7						6.4		15.0						
30SEP62	730A	123	3.5	22	40	2.3	3.2	2.1	79000	595	49000	6.6		15.8						
30SEP62	100P	123	4.5	24	53	3.3						6.7		17.0						
30SEP62	715P	123	5.7	23	66	3.8						6.6		16.6						
1OCT62	1250A	136	6.6	24	77	4.8						6.5		21.3						
1OCT62	735A	136	5.0	23	57	3.7	2.9	2.1	46000	303	23000	6.6		19.1						
1OCT62	455P	136	5.5	24	64	4.0								18.6						
2OCT62	100A	136	5.7	24	67	4.2						6.5		22.3						
2OCT62	730A	136	4.7	23	54	3.4	2.6	2.1	141000	1174	79000	6.6		26.6						

EP22 - Old U. S. 11 bridge over East Pearl River, W. of Santa Rosa, Miss.

DATE	TIME	FLOW C.F.S.	D.O. mg/l	TEMP. °C	% SAT	D.O. 1000lbs/DA	B.O.D. mg/l	B.O.D. 1000lbs/DA	COLIFORM MPN/100ml	B.P.E.	E.COLI MPN/100ml	pH	SALINITY P.P.T.	C.O.D. mg/l	T. ALK. mg/l	HARDNESS mg/l	TURBID	COLOR	T.S.S. mg/l	V.S. mg/l
12SEP62	1245P	173	5.7	29	72	5.3	1.9	1.8	11000	116	2000									
13SEP62	1145P	156	6.1	29	77	5.1	2.4	2.0	4900	47	800	6.5								
14SEP62	115P	140	7.0	29	90	5.3	3.2	2.4	4900	42	2300	6.9								
17SEP62	230P	161	7.2	29	92	6.2	3.0	2.6	17200	164	2120	6.7			24	10	22	50		
18SEP62	330P	153	6.5	28	83	5.4	2.8	2.3	34800	326	3300	6.7								
19SEP62	1010A	148	6.0	29	75	4.8	1.9	1.5	17200	156	1410	6.6			24		10	52		
20SEP62	1020A	142	5.6	26	68	4.3	2.3	1.8	7900	69	1720	6.8			26					
21SEP62	930A	135	6.0	25	72	4.4	2.5	1.8	17200	142	3300	6.6			26					
22SEP62	1005A	132	5.8	25	69	4.1	2.6	1.8	17200	139	7900	6.9			27					
24SEP62	1200P	126	5.5	25	66	3.7	2.7	1.8	10800	84	790	6.7			25					
25SEP62	950A	123	5.8	25	70	3.9	2.5	1.7	22100	169	700	6.7			26					
26SEP62	1245P	124	4.6	24	56	3.1	2.5	1.7	22100	148	1720	6.7			29		15	46		
27SEP62	1255P	122	5.3	25	63	3.5	2.6	1.6	34800	260	2210	6.5		37.6	27					
27SEP62	600P	122	6.3	26	77	4.1						6.4								
28SEP62	900A	122	5.8	24	67	3.8	2.6	1.7	33000	246	2200	6.7		41.3	28					
	Avg.	139	5.9	26	73	4.5	2.5	1.9	18089	150	2319	6.7		39.4	26	10	16	49		
	Max.	173	7.2	29	92	6.2	3.2	2.6	34800	326	7900	6.9		41.3	29	10	22	52		
	Min.	122	4.6	24	56	3.1	1.9	1.5	4900	42	700	6.4		37.6	24	10	10	46		
	R	51	2.6	5	36	3.1	1.3	1.1	29900	284	7200	0.5		3.7	5	0	12	6		
	n	15	15	15	15	15	14	14	14	14	14	14		2	10	1	3	3		
28SEP62	545P	122	4.8	24	56	3.2						6.6		11.5						
29SEP62	130A	122	0.0	24	00	0.0								82.5						
29SEP62	750A	122	0.0	22	00	0.0	30.8	20.3	348000	2598	78000	6.6		102.0	40					
29SEP62	230P	122	0.1	23	01	0.1						6.6		91.2						
29SEP62	610P	122	0.0	24	00	0.0						6.4		84.1						
30SEP62	245A	125	1.0	22	11	0.7						6.6		43.6						
30SEP62	800A	125	0.1	23	06	0.1	12.1	8.2	79000	604	10900	6.6		47.6						
30SEP62	120P	125	0.0	24	00	0.0						6.5		64.1						
30SEP62	740P	125	0.6	22	06	0.4								23.8						
1OCT62	115A	137	2.0	24	24	1.5						6.4		35.2						
1OCT62	800A	137	4.3	24	50	3.2	3.2	2.4	22100	165	4600	6.7		23.6						
1OCT62	510P	137		24										29.2						
2OCT62	125A	137	5.9	24	69	4.4						6.5		24.1						
2OCT62	800A	137	6.7	24	79	4.9	2.2	1.6	17200	144	1300	6.6		23.3						

TABLE A-18 - EAST PEARL RIVER

EP16 - Dock at Pearl River Marina, Gainesville, Miss.

DATE	TIME	FLOW C.F.S.	D.O. mg/l	TEMP. °C	% SAT	D.O. 1000lbs/DA	B.O.D. mg/l	B.O.D. 1000lbs/DA	COLIFORM MPN/100ml	B.P.E.	E.COLI MPN/100ml	pH	SALINITY P.P.T.	C.O.D. mg/l	T. ALK. mg/l	HARDNESS mg/l	TURBID	COLOR	T.S.S. mg/l	V.S. mg/l
29SEP62	300P		6.9	25	82							6.6								
30SEP62	320A		4.7	23	54							6.6								
30SEP62	830A		5.8	24	58		1.7		1090		330									
30SEP62	145P		6.9	27	86							6.8								
30SEP62	805P		7.0	24	62															
1OCT62	145A		5.5	24	68							6.7								
1OCT62	830A		6.3	24	75		2.2		7900		20	6.6		166.0*						
1OCT62	530P		4.7	26	57															
2OCT62	155A		4.2	25	50							6.5								
	Avg.		5.7	25	68		2.0		4495		175	6.6		166.0*						
	Max.		7.0	27	86		2.2		7900		330	6.8		166.0						
	Min.		4.2	23	50		1.7		1090		20	6.4		166.0						
	R		2.8	4	36		0.5		6810		310	0.4		0						
	n		9	9	9		2		2		2	6		1						
2OCT62	830A		1.1	24	13		7.9		92000		54200	6.7		1980*						

EP8 - Stream gage, Logtown, Miss.

DATE	TIME	FLOW C.F.S.	D.O. mg/l	TEMP. °C	% SAT	D.O. 1000lbs/DA	B.O.D. mg/l	B.O.D. 1000lbs/DA	COLIFORM MPN/100ml	B.P.E.	E.COLI MPN/100ml	pH	SALINITY P.P.T.	C.O.D. mg/l	T. ALK. mg/l	HARDNESS mg/l	TURBID	COLOR	T.S.S. mg/l	V.S. mg/l
29SEP62	345P		5.8	26	70							6.6								
29SEP62	845P		7.4	26	89							6.4								
30SEP62	355A		6.8	24	80							6.5								
30SEP62	900A		7.3	26	89		1.2		1750		130	6.6								
30SEP62	215P		8.2	28	103							6.5								
30SEP62	830P		9.3	25	111															
1OCT62	210A		7.6	24	89							6.7								
1OCT62	900A		7.2	26	87		1.1		7900		230	6.8								
1OCT62	555P		6.0	26	73															
2OCT62	225A		6.7	25	80							6.4		723.0*						
2OCT62	905A		6.6	26	78		1.4		13000		460	6.6		854.0*						
	Avg.		7.2	26	86		1.2		7550		273	6.6		788.5*						
	Max.		9.3	28	111		1.4		13000		460	6.8		854.0						
	Min.		5.8	24	70		1.1		1750		130	6.4		723.0						
	R		3.5	4	41		3		11250		330	0.4		131.0						
	n		11	11	11		3		3		3	9		2						

* Chloride Interference

TABLE A-19 - EAST PEARL RIVER

DATE	TIME	FLOW C.F.S.	D.O. mg/l	TEMP. °C	% SAT	D.O. 1000lbs/DA	B.O.D. mg/l	B.O.D. 1000lbs/DA	COLIFORM MPN/100ml	B.P.E.	E.COLI MPN/100ml	pH	SALINITY P.P.T.	C.O.D. mg/l	T. ALK. mg/l	HARDNESS mg/l	TURBID	COLOR	T.S.S. mg/l	V.S. mg/l
EP5T - U. S. 90 bridge over East Pearl River (surface sample)																				
11SEP62	110P		7.5	29	99		2.8		3300		220	7.0	3.5							
12SEP62	1040A		6.0	29	81		1.9		2300		130	6.7	3.9							
13SEP62	715P		6.6	29	90		1.6		1720		170		8.9		28	9500	11	23		
17SEP62	1250P		6.6	30	90		1.6		2300		50	6.7	7.2							
18SEP62	210P		6.8	30	92		1.6		2210		80	6.9	4.6		36		10	24		
19SEP62	425P		6.6	29	90		1.3		17200		1090	6.8	9.2		34					
20SEP62	605P		5.9	28	78		1.6		4900		230	6.8	7.2		38					
21SEP62	640P		6.3	26	81		2.3		3300		130		9.8		[illegible]					
22SEP62	755P		5.1	26	66		1.2		2120		130	6.6	10.6		36					
24SEP62	1005P		6.2	26	81		1.3		7000		170	6.7	11.6		39					
25SEP62	1050P		4.9	26	64		1.3		2300		330	6.7	13.3		34		10	24		
26SEP62	1200M		4.5	26	58		1.0		4900		330	6.6	10.6		38					
27SEP62	310P		7.3	26	93		1.6		1300		50	6.8	9.8							
27SEP62	630P		7.3	27	93							6.6								
28SEP62	1005A		6.6	24	78		1.4		1720		170	6.8	8.7	96.7	34					
28SEP62	650P		7.4	26	90							6.6		96.7						
29SEP62	200A		7.4	24	88															
29SEP62	950A		7.6	25	88		1.3		230		20	6.9	8.2		26					
29SEP62	400P		6.6	25	102							7.0								
29SEP62	930P		8.3	26	101							6.5								
30SEP62	420A		7.6	24	89							6.8								
30SEP62	930A		5.6	27	67		1.6		4900		40	6.9								
30SEP62	245P		8.6	28	106							6.9								
30SEP62	850P		8.0	25	95															
1OCT62	230A		8.3	26	101							7.1		802.0*						
1OCT62	930A		8.1	26	99		1.6		3300		700	6.9								
1OCT62	610P		2.2	28	28									772.0*						
2OCT62	250A		7.8	26	98							6.5								
2OCT62	930A		5.0	26	61		1.7		7900		1300	6.8								
	Avg.		6.7	27	84		1.6		4050		297	6.8	8.7	443.1	34	9500	10	24		
	Max.		8.6	30	106		2.8		17200		1090	7.1	13.3	802.0	42	9500	11	25		
	Min.		2.2	24	28		1.0		230		20	6.4	3.5	96.7	26	9500	10	24		
	R		6.4	6	78		1.8		16970		1070	0.7	9.8	705.3	16	0	1	1		
	n		29	29	29		18		18		18	24	15	4	11	1	3	3		
EP5B - U. S. 90 bridge over East Pearl River (bottom sample)																				
11SEP62	1250P		2.6	29	38		1.6		790		50	7.0	18.3							
12SEP62	1025A		1.7	30	24		1.0		80		20	6.9	14.5							
13SEP62	715P		1.8	29	25		0.8		220		20	5.8	14.1							
17SEP62	1235P		2.3	30	29		0.3		80		20	7.0	16.6		52	2540	10	11		
18SEP62	150P		1.9	30	27		0.2		50		20	6.9	12.8							
19SEP62	410P		1.8	30	23		0.2		80		20	6.9	15.8		59		12	13		
20SEP62	550P		2.7	28	38		0.6		230		50	7.1	15.2		57					
21SEP62	620P		4.5	28	62		0.6		220		50		15.2		57					
22SEP62	735P		3.4	26	45		0.7		790		80	6.5	14.9		52					
24SEP62	950P		4.0	26	54		1.8		330		20	6.6	17.0		58					
25SEP62	1035P		4.7	26	63		0.6		460		50	6.8	15.7		58					
26SEP62	1120P		4.0	25	53		1.5		140		50	7.0	18.6		58		70	23		
27SEP62	255P		3.5	26	47		0.6		460		50	7.0	16.5		56					
28SEP62	930A		3.0	26	40		0.6		490		20	7.0	17.5		58					
29SEP62	935A		2.3	26	31		0.3		630		50	6.9	18.2		56					
	Avg.		2.9	28	40		0.7		337		37	6.8	16.1		55	2540	31	16		
	Max.		4.7	30	63		1.8		790		80	7.1	18.6		59	2540	70	23		
	Min.		1.7	25	23		0.2		50		20	5.8	12.8		50	2540	10	11		
	R		3.0	5	40		1.6		740		60	1.3	5.8		9	0	60	12		
	n		15	15	15		15		15		15	14	15		11	1	3	3		

* Chloride Interference

TABLE A-20 - SALT WATER

DATE	TIME	FLOW C.F.S.	D.O. mg/l	TEMP. °C	% SAT	D.O. 000lbs/DA	B.O.D. mg/l	B.O.D. 000lbs/DA	COLIFORM MPN/100ml	B.P.E.	E.COLI MPN/100ml	pH	SALINITY P.P.T.	C.O.D. mg/l	T. ALK. mg/l	HARDNESS mg/l	TURBID	COLOR	T.S.S. mg/l	V.S. mg/l
EP4T - Downstream from U. S. 90 bridge (surface sample)																				
18SEP62	143P			32					440		49	6.9	8.9							
20SEP62	130P			30					1700		220	6.8	8.8							
24SEP62	135P			28					170		23	6.8	13.1							
26SEP62	1045A			29					5400		990	6.8	10.0							
28SEP62	1030A			28					1300		70	7.0	7.9							
	Avg.			29					1842		262	6.9	9.7							
	Max.			32					5400		990	7.0	13.1							
	Min.			28					170		23	6.8	7.9							
	R			4					5230		967	0.2	5.2							
	n			5					5		5	5	5							
EP4B - Downstream from U. S. 90 bridge (bottom sample)																				
18SEP62	143P			31								6.9	17.1							
20SEP62	130P			31					17		7	7.0	17.4							
24SEP62	135P			28					220		33	7.2	17.6							
26SEP62	1045A			29					490		130	6.9	13.7							
28SEP62	1030A			28					49		22	7.0	16.5							
	Avg.			29					194		48	7.0	16.4							
	Max.			31					490		130	7.2	17.4							
	Min.			28					17		7	6.9	13.7							
	R			3					473		123	0.3	3.7							
	n			5					4		4	5	5							
EP2T - About 3 miles downstream from U. S. 90 bridge (surface sample)																				
18SEP62	133P			31					490		33	7.2	9.6							
20SEP62	120P			31					790		26	7.2	11.2							
24SEP62	125P			28					790		49	6.9	15.6							
26SEP62	1039A			28					1300		110	6.9	11.9							
28SEP62	1021A			27					330		49	7.3	9.2							
	Avg.			29					740		53	7.1	11.5							
	Max.			31					1300		110	7.3	15.6							
	Min.			27					330		26	6.9	9.2							
	R			4					970		84	0.4	6.4							
	n			5					5		5	5	5							
EP2B - About 3 miles downstream from U. S. 90 bridge (bottom sample)																				
18SEP62	133P			31								6.9	16.7							
20SEP62	120P			31					170		22	7.0	16.3							
24SEP62	125P			28					110		46	7.2	16.2							
26SEP62	1035A			28					70		49	7.1	18.6							
28SEP62	1021A			28					230		23	7.3	12.3							
	Avg.			29					145		35	7.1	16.4							
	Max.			31					230		49	7.3	18.6							
	Min.			28					70		22	6.9	12.3							
	R			3					160		27	0.4	6.3							
	n			5					4		4	5	5							

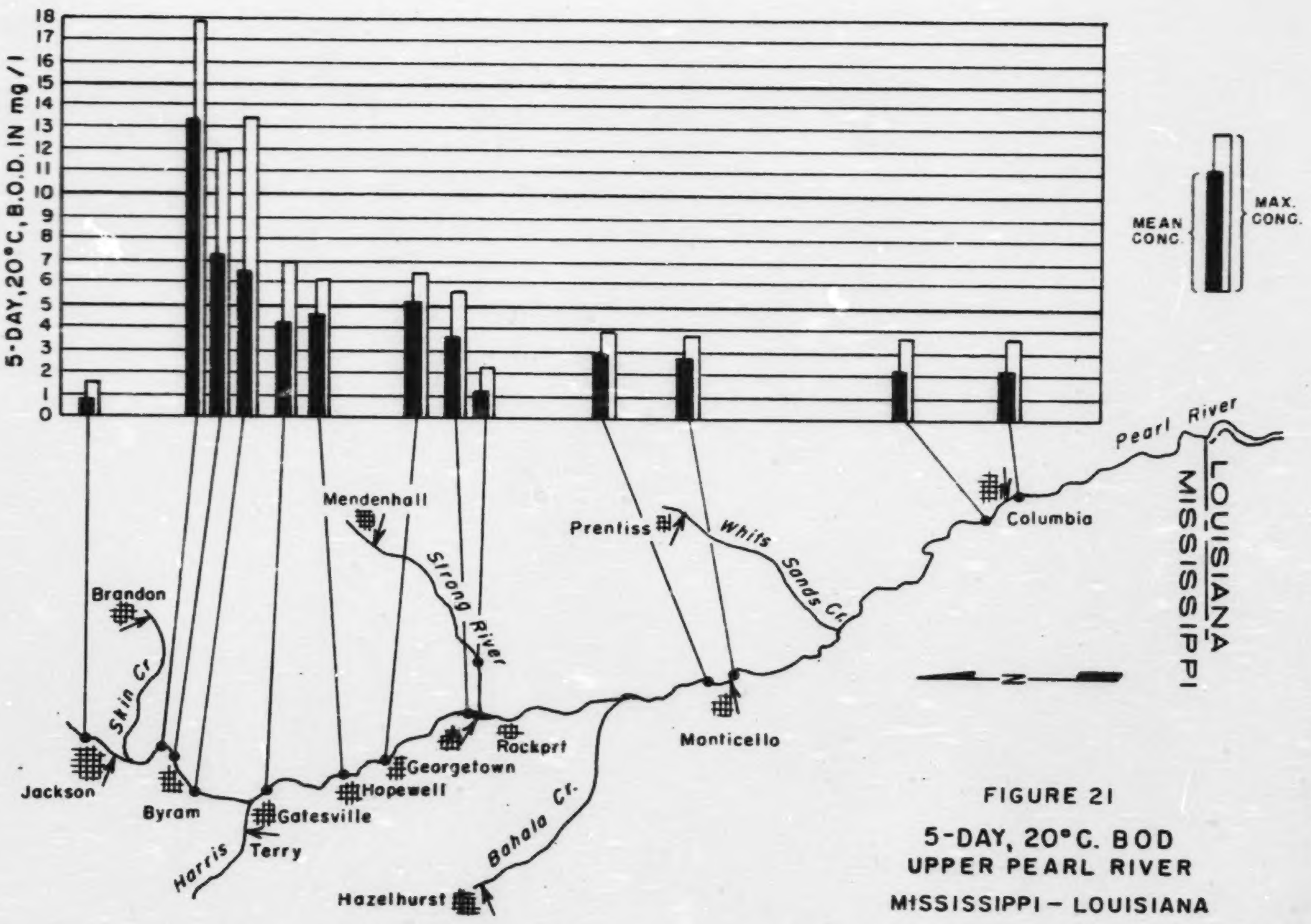


FIGURE 21

5-DAY, 20°C. BOD
UPPER PEARL RIVER
MISSISSIPPI – LOUISIANA

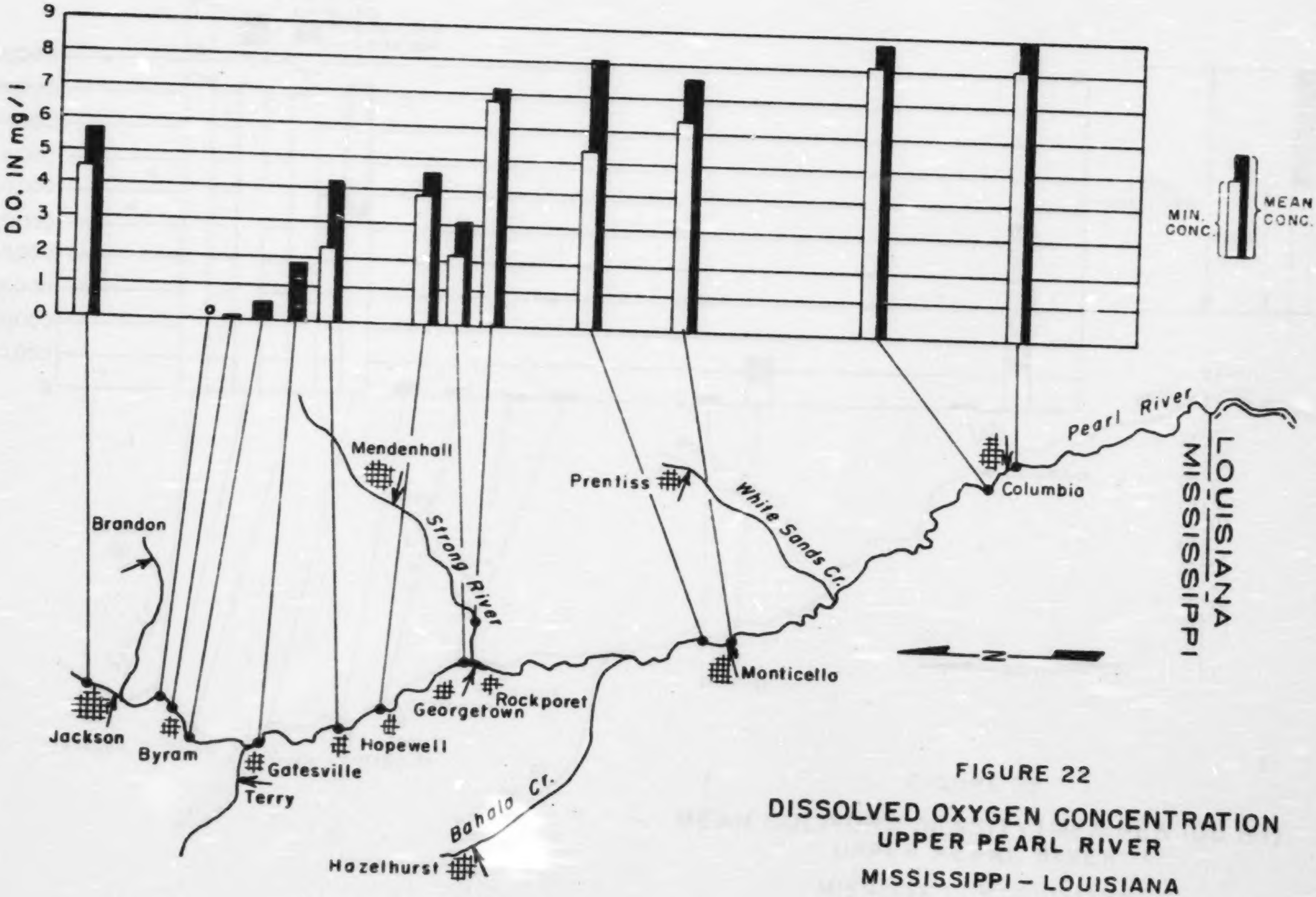


FIGURE 22

DISSOLVED OXYGEN CONCENTRATION
UPPER PEARL RIVER
MISSISSIPPI – LOUISIANA

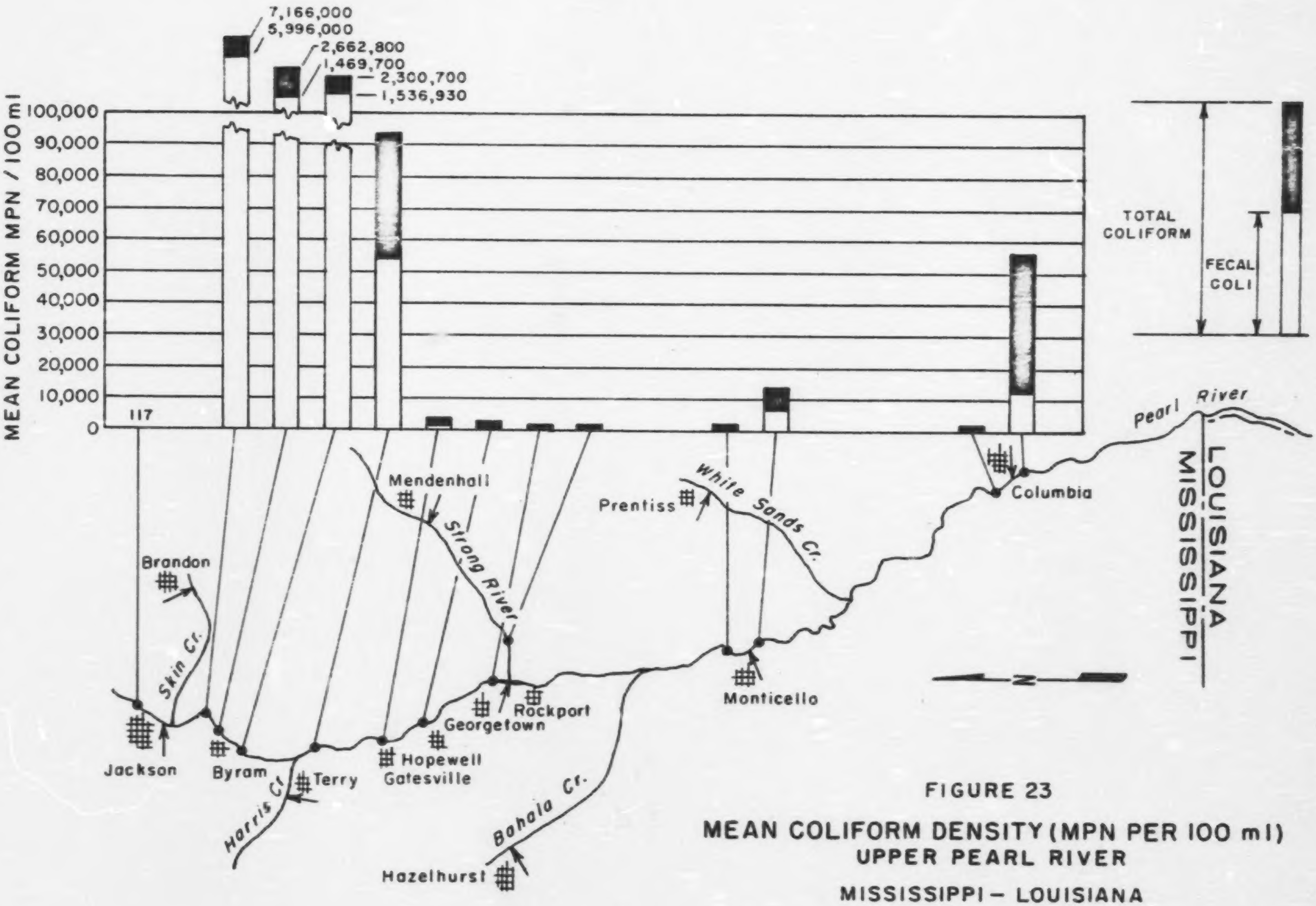


FIGURE 23

MEAN COLIFORM DENSITY (MPN PER 100 ml)
UPPER PEARL RIVER
MISSISSIPPI – LOUISIANA

TABLE A-21 - SALT WATER

DATE	TIME	FLOW C.F.S.	D.O. mg/l	TEMP. °C	% SAT	D.O. 1000lbs/DA	B.O.D. mg/l	B.O.D. 1000lbs/DA	COLIFORM MPN/100ml	B.P.E.	E.COLI MPN/100ml	pH	SALINITY P.P.T.	C.O.D. mg/l	T. ALK. mg/l	HARDNESS mg/l	TURBID	COLOR	T.S.S. mg/l	V.S. mg/l
EPOT - Confluence of Old Pearl and East Pearl Rivers (surface sample)																				
18SEP62	125P			32					1100		110	7.2	8.8							
20SEP62	112P			30					490		79	7.2	12.6							
24SEP62	115P			27					17		8	7.2	20.3							
26SEP62	1025A			28					1100		130	7.1	11.9							
28SEP62	1015A			27					330		130	7.4	6.9							
	Avg.			29					607		91	7.2	12.1							
	Max.			32					1100		130	7.4	20.3							
	Min.			27					17		8	7.1	6.9							
	R			5					1083		122	0.3	13.4							
	n			5					5		5	5	5							
EPOB - Confluence of Old Pearl and East Pearl Rivers (bottom sample)																				
18SEP62	125P											7.0	19.6							
20SEP62	112P			30					110		23	7.5	18.8							
24SEP62	115P			27					27		7	7.4	20.4							
26SEP62	1025A			28					140		33	7.0	19.6							
28SEP62	1015A			27					310		17	7.3	12.7							
	Avg.			28					147		20	7.2	17.9							
	Max.			30					310		33	7.5	20.4							
	Min.			27					27		7	7.0	12.7							
	R			3					283		26	0.5	7.7							
	n			4					4		4	5	5							
LLAT - Mouth of Little Lake Pass (surface sample)																				
18SEP62	110P			31					110		23	7.2	12.7							
20SEP62	105P			30					490		130	7.6	13.6							
24SEP62	100P			27					4		4	7.2	21.1							
26SEP62	1020A			28					23		23	7.1	14.1							
28SEP62	1010A			27					490		31	7.5	7.3							
	Avg.			29					223		42	7.3	13.8							
	Max.			31					490		130	7.6	21.1							
	Min.			27					4		4	7.1	7.3							
	R			4					486		126	0.5	13.8							
	n			5					5		5	5	5							
LLAB - Mouth of Little Lake Pass (bottom sample)																				
18SEP62	110P			31								7.0	16.5							
20SEP62	105P			30					130		17	7.2	17.2							
24SEP62	100P			27					17		4	7.3	21.4							
26SEP62	1020A			28					280		49	7.2	19.3							
28SEP62	1010A			27					33		13	7.2	18.8							
	Avg.			29					115		21	7.2	19.1							
	Max.			31					280		49	7.3	21.4							
	Min.			27					17		4	7.0	16.5							
	R			4					263		45	0.3	4.9							
	n			5					4		4	5	5							

TABLE A-22 - SALT WATER

DATE	TIME	FLOW C.F.S.	D.O. mg/l	TEMP. °C	% SAT	D.O. 1000lbs/DA	B.O.D. mg/l	B.O.D. 1000lbs/DA	COLIFORM MPN/100ml	B.P.E.	E.COLI MPN/100ml	pH	SALINITY P.P.T.	C.O.D. mg/l	T. ALK. mg/l	HARDNESS mg/l	TURBID	COLOR	T.S.S. mg/l	V.S. mg/l
LB5T - Confluence of East Pearl and Lake Borgne (surface sample)																				
18SEP62	105P			31					130		23	7.3	16.5							
20SEP62	1250P			30					110		110	7.5	20.3							
24SEP62	1240P			27					2		2	7.4	22.6							
26SEP62	1005A			28					230		130	7.4	19.6							
28SEP62	955A			27					49		23	7.4	13.5							
	Avg.			29					104		58	7.4	18.5							
	Max.			31					230		130	7.5	22.6							
	Min.			27					2		2	7.3	13.5							
	R			4					228		128	0.2	9.1							
	n			5					5		5	5	5							
LB5B - Confluence of East Pearl and Lake Borgne (bottom sample)																				
18SEP62	105P											7.0	18.4							
20SEP62	1250P			29					95		17	7.7	19.9							
24SEP62	1240P			27					2		2	7.5	22.7							
26SEP62	1005A			28					37		8	7.8	22.4							
28SEP62	955A			27					95		23	7.5	17.5							
	Avg.			28					57		12	7.5	20.2							
	Max.			29					95		23	7.8	22.7							
	Min.			27					2		2	7.0	17.5							
	R			2					93		21	0.8	5.2							
	n			4					4		4	5	5							
LB6T - Near Pearl River Light (surface sample)																				
18SEP62	1258P			31					4		2	7.5	19.7							
20SEP62	1243P			30					2		2	7.6	21.5							
24SEP62	1235P			27					2		2	7.7	22.9							
26SEP62	956A			28					140		44	7.8	21.0							
28SEP62	947A			26					44		17	7.5	16.1							
	Avg.			28					39		14	7.7	20.2							
	Max.			31					140		44	7.8	22.9							
	Min.			26					2		2	7.5	16.1							
	R			5					138		44	0.3	6.8							
	n			5					5		5	5	5							
LB6B - Near Pearl River Light (bottom sample)																				
18SEP62	1258P			31								7.7	20.3							
20SEP62	1243P			30								7.5	21.0							
24SEP62	1235P			27								7.6	22.6							
26SEP62	954A			28								7.9	22.8							
28SEP62	947A			26								7.8	16.9							
	Avg.			28								7.7	20.7							
	Max.			31								7.9	22.8							
	Min.			26								7.5	16.9							
	R			5								0.4	5.9							
	n			5								5	5							

TABLE A-25 - SALT WATER

DATE	TIME	FLOW C.F.S.	D.O. mg/l	TEMP. °C	% SAT	D.O. 1000lbs/DA	B.O.D. mg/l	B.O.D. 1000lbs/DA	COLIFORM MPN/100ml	B.P.E.	E. COLI MPN/100ml	pH	SALINITY P.P.T.	C.O.D. mg/l	T. ALK. mg/l	HARDNESS mg/l	TURBID	COLOR	T.S.S. mg/l	V.S. mg/l
HBT - Heron Bay (surface sample)																				
18SEP62	1244P			31					27		2	7.8	19.0							
20SEP62	1232P			30					2		2	7.6	20.5							
24SEP62	1222P			27					7		4	7.6	22.1							
26SEP62	942A			28					6		2	7.7	22.8							
28SEP62	935A			25					2		2	7.8	20.6							
	Avg.			28					9		2	7.7	21.0							
	Max.			31					27		4	7.8	22.8							
	Min.			25					2		2	7.6	19.0							
	R			6					25		2	0.2	3.8							
	n			5					5		5	5	5							
GIPT - Grand Island Pass, Grassy Is. (surface sample)																				
18SEP62	1230P			31					2		2	7.6	19.5							
20SEP62	1225P			30					2		2	7.7	22.2							
24SEP62	1215P			27					2		2	7.7	22.7							
26SEP62	935A			27					23		2	8.0	23.1							
28SEP62	930A			27					4		2	7.8	17.6							
	Avg.			28					7		2	7.8	21.0							
	Max.			31					23		2	8.0	23.1							
	Min.			27					2		2	7.6	17.6							
	R			4					21		0	0.4	5.5							
	n			5					5		5	5	5							
GIPB - Grand Island Pass, Grassy Is. (bottom sample)																				
18SEP62	1230P			31								7.6	20.0							
20SEP62	1225P			29								7.7	22.1							
24SEP62	1215P			27								7.7	23.0							
26SEP62	935A			27								8.0	23.1							
28SEP62	930A			27								7.8	19.0							
	Avg.			28								7.8	21.4							
	Max.			31								8.0	23.1							
	Min.			27								7.6	19.0							
	R			4								0.4	4.1							
	n			5								5	5							

TABLE A-34 - SALT WATER

DATE	TIME	FLOW C.F.S.	D.O. mg/l	TEMP. °C	% SAT	D.O. 1000lbs/DA	B.O.D. mg/l	B.O.D. 1000lbs/DA	COLIFORM MPN/100ml	B.P.E.	E.COLI MPN/100ml	pH	SALINITY P.P.T.	C.O.D. mg/l	T. ALK. mg/l	HARDNESS mg/l	TURBID	COLOR	T.S.S. mg/l	V.S. mg/l
S9T - St. Joseph Pt. (surface sample)																				
18SEP62	1223P			31					4		2	7.6	22.1							
20SEP62	1213P			29					2		2	7.7	22.4							
24SEP62	1200N			27					2		2	7.7	21.9							
26SEP62	922A			27					2		2	8.0	23.9							
28SEP62	917A			27					2		2	8.0	19.7							
	Avg.			28					2		2	7.8	22.0							
	Max.			31					4		2	8.0	23.9							
	Min.			27					2		2	7.6	19.7							
	R			4					2		0	0.4	4.2							
	n			5					5		5	5	5							
S9B - St. Joseph Pt. (bottom sample)																				
18SEP62	1223P			31								7.5	21.0							
20SEP62	1213P			29								7.7	22.8							
24SEP62	1200N			27								7.8	24.0							
26SEP62	922A			27								8.0	23.7							
28SEP62	917A			27								7.9	20.5							
	Avg.			28								7.8	22.4							
	Max.			31								8.0	24.0							
	Min.			27								7.5	20.5							
	R			4								0.5	3.5							
	n			5								5	5							
S10T - Off Bayou Caddy (surface sample)																				
18SEP62	1207P			31					4		2	7.8	22.4							
20SEP62	1200N			29					2		2	7.8	23.7							
24SEP62	1145A			27					2		2	7.8	24.0							
26SEP62	910A			27					2		2	8.0	24.9							
28SEP62	905A			26					2		2	7.9	23.5							
	Avg.			28					2		2	7.9	23.7							
	Max.			31					4		2	8.0	24.9							
	Min.			26					2		2	7.8	22.4							
	R			5					0		0	0.2	2.5							
	n			5					5		5	5	5							
S10B - Off Bayou Caddy (bottom sample)																				
18SEP62	1207P			31								7.7	22.4							
20SEP62	1200N			29								7.6	23.9							
24SEP62	1145A			27								7.8	23.9							
26SEP62	910A			27								8.0	25.0							
28SEP62	905A			26								7.8	23.8							
	Avg.			28								7.8	23.9							
	Max.			31								8.0	25.0							
	Min.			26								7.6	22.4							
	R			5								0.4	2.6							
	n			5								5	5							

OTHER DATA

Long-Term B.O.D.

Three different samples were collected at both P-71 and P-42 for long-term B.O.D.'s. These data are shown in Table A25, along with the ultimate B.O.D. and the reaction constants K_1 to the base $\underline{e}$, which were calculated on the analog computer.

Sewer Analyses, Crown Zellerbach Corp.

Twenty-four composite samples were collected from the two sewers at the Bogalusa Division by Crown Zellerbach and analyzed by them. These data are tabulated in Table A26.

TABLE A-25

Long-Term B.O.D.
Pearl River - 1962

P-71

Date	Time	B.O.D.	Date	Time	B.O.D.	Date	Time	B.O.D.
9/15	12:30p	0	9/18	5:45p	0	9/20	10:00p	0
9/16	9:00a	1.58	9/18	11:00p	0.36	9/21	10:00a	1.17
9/17	12:30p	3.14	9/19	5:15p	1.37	9/21	10:00p	1.75
9/18	12:00p	4.23	9/20	5:15p	2.90	9/22	10:00p	3.15
9/19	11:00a	4.90	9/21	5:00p	4.22	9/23	9:15p	4.30
9/20	11:00a	5.55	9/22	5:00p	4.72	9/24	10:15p	5.00
9/20	10:00p	5.75	9/23	5:00p	5.41	9/25	9:30p	5.57
9/21	12:00p	6.03	9/24	5:10p	5.92	9/26	10:30p	6.06
9/22	11:00a	6.33	9/25	5:15p	6.37	9/27	10:00p	6.26
9/23	12:00n	6.78	9/26	5:15p	6.82	9/28	9:30p	6.64
9/24	12:00n	7.36	9/27	5:00p	7.28	9/29	8:30p	7.23
9/25	12:30p	7.51	9/28	5:00p	7.82	9/30	10:00p	7.52
9/26	11:30a	7.67	9/29	5:00p	7.97	10/1	9:00a	7.49
9/27	11:30a	7.85	9/30	4:00p	8.13	10/2	9:00p	7.82
			10/1	4:15p	8.35	10/3	9:00p	7.74
			10/2	4:15p	8.47	10/4	8:15p	7.92
			10/3	4:30p	8.57	10/5	9:15p	8.28
			10/4	4:00p	8.95			
			10/5	4:00p	9.02			
Ult. B.O.D. = 8.5 mg/l K_1 = 0.21			Ult. B.O.D. = 9.1 mg/l K_1 = 0.21			Ult. B.O.D. = 8.5 mg/l K_1 = 0.21		

P-42

Date	Time	B.O.D.	Date	Time	B.O.D.	Date	Time	B.O.D.
9/15	5:00p	0	9/18	6:15p	0	9/20	12:30p	0
9/16	9:00a	0.68	9/18	11:00p	0.25	9/21	12:00n	0.85
9/17	5:00p	1.50	9/19	5:15p	0.79	9/22	11:00a	1.32
9/18	4:00p	1.98	9/20	5:15p	1.41	9/23	12:00p	1.87
9/19	5:15p	2.61	9/21	5:00p	2.20	9/24	12:00n	2.25
9/20	5:15p	3.08	9/22	5:00p	2.66	9/25	12:30p	2.71
9/21	5:00p	3.38	9/23	5:00p	3.11	9/26	11:30a	2.99
9/22	5:00p	3.68	9/24	5:10p	3.41	9/27	11:30a	3.32
9/23	5:00p	4.18	9/25	5:15p	3.86	9/28	2:00p	3.50
9/24	5:10p	4.38	9/26	5:15p	4.21	9/29	12:00p	3.68
9/25	5:15p	4.64	9/27	5:00p	4:45	9/30	1:30p	4.05
9/26	5:15p	5.03	9/28	5:00p	4.60	10/1	12:15p	4.12
9/27	5:00p	4.98	9/29	5:00p	4.81	10/2	12:00p	4.25
9/28	5:00p	5.20	9/30	4:00p	4.83	10/3	11:30a	4.65
9/29	5:00p	5.48	10/1	4:15p	5.19	10/4	11:15a	4.51
			10/2	4:15p	5.29	10/5	12:30p	4.92
			10/3	4:30p	5.31	10/6	11:30a	4.95
			10/4	4:00p	5.61			
Ult. B.O.D. = 6.4 mg/l K_1 = 0.15			Ult. B.O.D. = 6.1 mg/l K_1 = 0.15			Ult. B.O.D. = 5.5 mg/l K_1 = 0.14		

TABLE A-26

Sewer Analyses for September 10 through September 30, 1962

Bogalusa Division of Crown Zellerbach

Date	Sewer Flow in MGD			BOD, lbs./Day			Pulp Losses, lb./Day		
	East Sewer	West Sewer	Total	East Sewer	West Sewer	Total	East Sewer	West Sewer	Total
Sept. 10, 1962	17.95	11.14	29.09	37,000	28,100	65,100	-28,000	- 7,860	-35,860
11	16.28	11.47	27.75	34,600	26,700	61,300	-40,000	-18,100	-58,100
12	16.66	10.92	27.58	37,800	26,000	63,800	-28,300	-18,100	-46,400
13	14.29	11.19	25.48	30,800	36,400	67,200	-62,500	-12,450	-74,950
14	15.41	11.84	27.25	32,500	24,300	56,800	-51,800	-30,800	-82,600
15	14.50	10.74	25.24	36,800	35,600	72,400	-22,850	- 6,920	-29,770
16	13.18	11.34	24.52	30,500	28,200	58,700	-21,400	-18,600	-40,000
17	12.56	8.95	21.51	28,000	30,900	58,900	-35,800	- 4,950	-40,750
18	14.96	8.83	23.79	43,700	22,600	66,300	-37,800	- 0	-37,800
19	16.74	8.40	25.14	33,500	20,500	54,000	-38,500	- 7,550	-46,050
20	13.40	11.18	24.58	28,800	23,000	51,800	-33,800	- 8,680	-42,480
21	12.93	13.06	25.99	20,500	26,900	47,400	-32,900	-18,150	-51,050
22	13.04	12.31	25.35	29,300	23,000	53,100	-21,400	-19,150	-40,550
23	19.61	4.92	24.53	36,200	6,450	42,650	-35,900	0	-35,900
24	14.96	10.54	25.50	-	-	-	-30,000	-11,850	-41,850
25	14.54	9.58	24.12	26,800	21,300	48,100	-46,500	- 9,400	-55,900
26	15.54	10.12	25.66	18,100	25,800	43,900	-27,300	- 4,200	-31,500
27	15.90	10.96	26.86	17,600	18,400	36,000	-35,600	-11,100	-46,700
28	14.93	13.37	28.30	21,300	28,200	49,500	-16,700	-17,400	-34,100
29	19.46	5.36	24.82	31,300	5,350	36,650	-28,900	0	-28,900
30	22.78	5.75	28.53	17,000	9,300	26,300	-44,800	0	-44,800

APPENDIX B

BIOLOGICAL DATA

APPENDIX B

BIOLOGICAL DATA

BASIC BIOLOGICAL PRINCIPLES

In natural habitats, there exists a wide variety of bottom organisms; each occupies a niche in the community where the characteristics of the individual are most efficiently utilized in the normal life processes. Each form of organism is limited in numbers by food supply, competition, predation, and the aquatic phase of its life cycle. In clean water habitats the interplay of the many forms of organisms allows no one form to dominate the community.

Most benthic forms also are limited to the type of environment they may occupy by physiological and morphological factors characteristic of the species. When an abnormal factor (for example, organic pollution) is added to the environment, those organisms not able to adjust to the environmental change succumb. Removal of the sensitive forms open up new niches for those organisms that remain, and if the pollutant can be utilized as food, the surviving organisms rapidly increase their numbers to occupy available space. This situation is best illustrated in the formation and organism population of sludge beds. Sensitive benthic forms (for example, immature mayflies and caddisflies) are driven out of their natural habitat as a result of the reduction in dissolved oxygen and/or smothering of the natural diverse substrate by the organic solids. Tolerant forms (sludgeworms and bloodworms) multiply rapidly in numbers by utilizing the organics in sludge as food. Thus, a natural stream bottom with a diverse substrate will support many different kinds of organisms with few individuals representing each kind; whereas, a sludge bed supports a tremendous population of organisms composed of two or three different kinds of individuals.

When toxic wastes, thermal pollutants or inorganic sediments are involved, tolerant forms show little if any increase in numbers. Severe conditions may make the environment adverse for even these, thus very few or even no organisms may survive in some reaches of a stream receiving such materials.

METHODS OF SURVEY

Two methods of collecting were used in this survey - qualitative and quantitative. Qualitative samples collect representative types of organisms living at a given station. Quantitative samples show population abundance and were taken with an Ekman dredge which collects 1/4 square foot of the bottom material. These samples were washed on a U. S. Standard #30 sieve and the remaining debris and organisms preserved. The organisms were removed from the sample in the laboratory, identified, enumerated and tabulated as number per square foot of bottom.

TABLE B-1

Species[1] of Bottom Dwelling Animals - Pearl River
September, 1962

	River Mile								
	P-77.3	P-74.3*	P-71.0	P-63.6	P-63.1	P-56.6	P-50.3	P-46.3	P-42.0
Stonefly Naiad	1	1	-	-	-	-	-	1	1
Mayfly Naiad	5	2	-	-	-	1	-	2	4
Caddisfly Larvae	1	3	-	-	-	-	-	2	3
Hellgrammite	1	1	-	-	-	1	1	-	1
Clam (Unionid)	2	2	-	-	-	1	-	2	1
Fingernail Clam	1	-	-	1	-	1	1	1	-
Snail (Operculate)	1	-	-	1	1	1	-	1	-
Snail (Pulmonate)	-	-	1	1	1	1	2	3	1
Sowbug	-	-	-	-	-	-	-	1	-
Scud	-	-	-	-	-	-	-	1	-
Aquatic Moth Larvae	-	-	-	-	-	-	-	1	-
Crane Fly Larvae	-	-	-	-	-	-	-	1	-
Horse Fly Larvae	-	-	1	-	1	-	-	-	-
Biting Midge Larvae	1	1	-	1	-	-	-	1	1
Midge Larvae (Bloodworm)	4	-	1	1	2	3	3	5	2
Beetle Larvae (Elmidae)	2	1	-	1	-	1	1	2	2
Giant Water Bug	-	-	-	-	-	-	1	-	-
Damselfly Naiad	1	-	1	1	-	-	2	1	-
Dragonfly Naiad	1	1	1	1	1	1	1	3	1
Leech	-	1	1	3	1	1	1	-	-
Sludgeworm	P	P	P	P	P	P	P	P	P
Total Kinds	22	14	7	12	9	13	14	29	18

* - Mississippi Shore - The Louisiana Shore supported only 2 kinds of bloodworms

P - Present - Various kinds of sludgeworms were not determined

1 - Tentative identifications

TABLE B-2

Mean Number of Organisms[1]
Per Square Foot of Bottom, Pearl River
September, 1962

	River Mile								
	P-77.3	P-74.3	P-71.0	P-63.6	P-63.1	P-56.6	P-50.3	P-46.3	P-42.0
Stonefly Naiad	-	-	-	-	-	-	-	4	-
Mayfly Naiad	7	-	-	-	-	-	-	1	-
Caddisfly Larvae	1	-	-	-	-	-	-	1	-
Clams (Unionid)	1	-	-	-	-	1	-	-	3
Fingernail Clams	1	-	-	1	-	-	-	-	-
Snail (Operculate)	1	-	-	-	1	-	-	-	1
Beetle Larvae (Elmidae)	-	-	-	1	-	-	-	-	7
Cranefly Larvae	-	-	-	-	-	-	-	1	-
Biting Midge Larvae	-	-	5	-	-	-	-	1	1
Midge Larvae (Bloodworm)	13	1	3	-	51	5	-	13	8
Dragonfly Naiad	-	1	-	1	-	-	-	-	-
Sludgeworm	171	152	2126	936	789	120	264	47	13
Leech	-	-	3	4	-	4	-	-	-
Total per sq. ft.	195	154	2137	943	841	130	264	68	33

1 - Tentative identifications

TABLE B-3

Mean Number of Organisms[1]
Per Square Foot of Bottom, East Pearl River
September, 1962

	River Mile							
	WH-6.0	H-15.7	H-9.7	H-3.9	EP-32.1	EP-28.4	EP-21.8	Farr's Slough
Mayfly Naiad	19	3	-	-	-	3	1	-
Caddisfly Larvae	3	1	-	-	3	3	1	-
Clams (Unionid)	-	-	-	-	-	-	-	1
Fingernail Clams	-	-	-	-	-	1	1	-
Beetle Larvae (Elmidae)	-	4	-	1	-	1	1	-
Crane Fly Larvae	4	1	-	-	-	-	-	-
Midge Larvae (Bloodworm)	49	19	5	103	23	195	7	16
Biting Midge	12	-	-	-	-	16	1	-
Horse Fly Larvae	-	3	-	-	-	-	-	-
Dragonfly Naiad	1	-	1	-	1	1	1	-
Leech	-	-	-	-	4	-	-	1
Sludgeworm	3	11	13	181	19	52	13	29
Total Number	91	42	19	285	50	272	26	47

---

1 - Tentative identifications

TABLE B-4

Species[1] of Bottom Dwelling Animals - East Pearl River
Before Fish-Kill

	River Mile							
	WH- 6.0	H- 15.7	H- 9.7	H- 3.9	EP- 32.1	EP- 28.4	EP- 21.8	Farr's Slough
Stonefly Naiad	2	1	-	-	1	1	1	1
Mayfly Naiad	10	3	3	-	2	1	2	6
Caddisfly Larvae	6	3	2	-	3	4	1	4
Hellgrammite	1	1	-	-	1	1	1	1
Clam (Unionid)	1	-	-	-	-	-	-	1
Fingernail Clam	-	-	-	-	-	-	1	1
Snail (Pulmonate)	2	-	1	-	2	1	2	1
Sowbug	-	-	-	-	-	-	1	-
Scud	-	-	-	-	1	-	-	-
Crayfish	-	-	-	-	1	-	-	-
Crane Fly Larvae	1	-	1	-	-	-	-	-
Snipe Fly Larvae	-	1	-	-	-	-	-	-
Black Fly Larvae	1	-	-	-	-	-	-	-
Horse Fly Larvae	-	-	-	-	-	-	1	-
Biting Midge Larvae	1	-	-	-	-	1	1	-
Midge Larvae (Bloodworm)	3	4	2	3	2	7	4	2
Beetle Larvae	5	3	1	-	3	3	3	1
Damselfly Naiad	2	1	1	-	3	2	3	-
Dragonfly Naiad	4	1	-	-	2	3	1	1
Leech	1	-	-	-	1	1	2	-
Sludgeworm	P	P	P	P	P	P	P	P
Total Kinds	41	19	12	4	23	26	25	20

P - Present - Various kinds of sludgeworms not determined

1 - Tentative identification

TABLE B-4, CONTINUED

After Fish-Kill

	River Mile			
	H- 3.9	EP- 32.1	EP- 28.4	EP- 21.8
Stonefly Naiad	-	-	-	-
Mayfly Naiad	-	-	-	-
Caddisfly Larvae	-	-	-	-
Hellgrammite	-	-	-	-
Clam (Unionid)	-	-	-	-
Fingernail Clam	-	-	-	-
Snail (Pulmonate)	-	1	1	1
Sowbug	-	-	-	-
Scud	-	-	-	-
Crayfish	-	-	-	-
Crane Fly Larvae	-	-	-	-
Snipe Fly Larvae	-	-	-	-
Black Fly Larvae	-	-	-	-
Horse Fly Larvae	-	-	-	-
Biting Midge Larvae	-	-	-	-
Midge Larvae (Bloodworm)	-	2	-	-
Beetle Larvae	-	3	2	-
Damselfly Naiad	-	2	-	2
Dragonfly Naiad	-	1	1	-
Leech	-	-	-	-
Sludgeworm	-	P	-	-
Total Kinds	0	9	5	3

P - Present - Various kinds of sludgeworms not determined

1 - Tentative identification

APPENDIX C

COMPUTATION OF OXYGEN SAG

APPENDIX C

COMPUTATION OF OXYGEN SAG

This appendix is concerned with the calculation of oxygen sag curves on the Lower Pearl River.

SURVEY PERIOD

Long-Term B.O.D.

Data on long-term B.O.D.'s are presented in Table A25. The K values, which were calculated on an electronic analog computer, are to the base e. Since the rate varied along the length of the river the factor $(1-e^{Kt})$ for various stations was proportioned to the time of passage and is shown in Table C1.

Time of Passage

Time of passage was determined by using Rhodamine B as a water mass tracer for a stream flow of approximately 1700 cfs. The time of passage to various stations from P-77 (drawbridge) is shown in Table C1.

PEARL RIVER SURVEY - LOUISIANA-MISSISSIPPI

TABLE NO. C-1

Station	Time of Passage, Hrs.	$1-e^{Kt}$
P77	0	0.67
P75	2.2	0.67
P73.5	3.9	0.66
P70.8	6.5	0.65
P63.5	14.2	0.63
P63.2	14.2	0.63
P60	17.9	
P56.7	21.4	0.60
P53.3	25.0	
P50.3	28.2	0.58
P46.3	32.5	0.56
P42.2	36.9	0.55

B.O.D.

The observed pounds of B.O.D. for various stations (from Appendix A) and the calculated ultimate B.O.D. (using functions from Table C1) are shown in Table C2. The average ultimate B.O.D. in river samples is plotted on Figure C1 and the range of values is also indicated. Curve No. 1 is for loads of 30,200 pounds per day at P-77, 51,000 pounds per day from Bogue Lusa Creek and K_1 values for the two loads of 0.192 per day. The fit is good for below Pool's Bluff (P-64), but there appears to be a greater load to the stream than the sum of 30,200 and 51,000 in order to account for the values at P-71.

PEARL RIVER SURVEY - LOUISIANA-MISSISSIPPI

CALCULATED ULTIMATE B.O.D., 1000 LBS./DAY

TABLE NO. C-2

Station	n	5-Day B.O.D. Avg.	5-Day B.O.D. Max.	5-Day B.O.D. Min.	5-Day B.O.D. R	Ult. B.O.D. Avg.	Ult. B.O.D. Max.	Ult. B.O.D. Min.
P77	10	20.2	33.6	10.1	23.5	30.2	50.1	15.1
P76	6	19.6	24.7	15.7	9.0	29.2	37	23.4
BLO	14	34.2	54.3	12.5	41.8	51.0	81.0	18.7
P74	3	60.4	83.2	38.3	44.9	91.5	136	58.0
P71	13	60.6	79.5	46.3	33.2	93.5	122.3	71.5
P64	16	48.7	58.7	39.7	19.0	77.5	93.4	63.0
P63	11	46.6	57.2	37.2	20.0	74.1	91	59.1
P57	10	43.0	59.4	33.0	26.4	71.9	99	55.0
P50	10	37.1	50.3	27.2	23.1	64.0	86.9	47.0
P46	3	35.9	37.3	34.6	3.7	64.2	66.5	61.9
P42	11	31.8	39.8	22.6	17.2	57.8	72.4	41.1

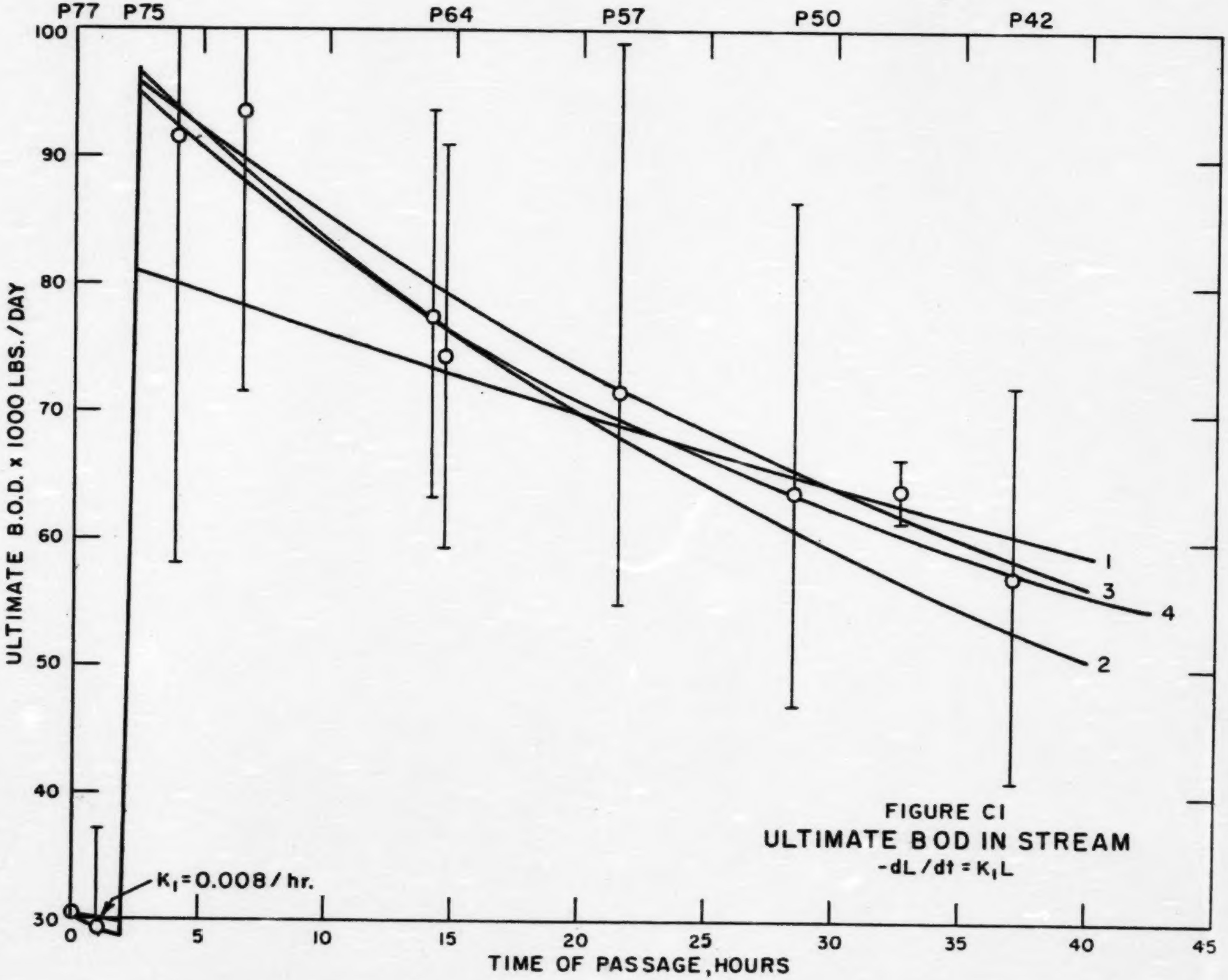


FIGURE C1
ULTIMATE BOD IN STREAM
$-dL/dt = K_1L$

Curve No. 2 is for loads of 30,200 pounds per day at P-77, 67,000 pounds per day from Bogue Lusa Creek or vicinity, and a K_1 value of 0.26 per day at P-75. The curve is a better fit from P-75 to Pool's Bluff. Curve No. 3 is for the same conditions at P-77 and K_1 of 0.19 per day at P-75. This curve is a better fit below the Sill than the previous curve. These curves are all drawn by the X-Y plotter as a readout of the computations made on the analog computer. Computation values are shown in Table C3.

From the first three curves it appears that there is some additional B.O.D. load to the stream in excess of that in the stream at P-77 plus that coming from Bogue Lusa Creek. There is also a different K_1 value above the Sill than below as borne out by the long-term B.O.D. values in Table A25. It should also be kept in mind that the seed for all of these determinations was collected in the vicinity of P-77.

These factors can be simulated on the analog computer and Curve No. 4 is the result. The load from Bogue Lusa Creek was set at the observed value of 51,000 and a K_1 value of 0.19 per day. An additional load of 18,000 in the vicinity of P-75 is simulated and the K value (K_3) is estimated to have a high rate of 0.72 per day, perhaps a rapid removal of B.O.D. by sedimentation in the impounded area above the Sill. The K_1 rate was also changed at P-64 to better fit the observed downstream conditions, by adding ΔK_1 to the circuit at unit time 14.2.

PEARL RIVER SURVEY - LOUISIANA-MISSISSIPPI

VALUES OF K_1/HR. IN THE STREAM

TABLE NO. C-3

Curve	L_{77}	L_{75}	S_{75}	$K_{1(77)}$	$K_{1(75)}$	$\Delta K_{1(75)}$	$K_{3(75)}$
1	30.2	51	-	0.008	0.008	-	-
2	30.2	67	-	0.035	0.011	-	-
3	30.2	67	-	0.035	0.008	-	-
4	30.2	51	18	0.035	0.008	-0.006	0.03

D.O.

Having established estimated loads going to the stream which will simulate observed conditions in the stream, the next step in computation is to estimate values of oxygenation and reaeration constants to simulate observed dissolved oxygen conditions.

Table C4 is a tabulation of the average D.O. conditions during the survey. The deficits are plotted on Figure C2. Table C5 is a tabulation of values used in computing the curves plotted on Figure C2. Because of reaeration at the Sill the computations were handled as two separate problems, above and below the Sill. The total of the simulated ultimate B.O.D. (18,000) and the zero or less oxygen condition in Bogue Lusa Creek is estimated to be 21,000 pounds per day and the demand to be exerted at a very high rate (K_3) simulating an immediate oxygen demand of short duration. The observed average deficit at P-77 of 8,300 pounds per day is used in the computations.

Curve No. 1 (Figure C2) uses the K_1 values from Curve No. 4 (Figure C1) and it is assumed that there is no net reaeration. Curve No. 2 is for different values of K_1 in order to obtain a better fit and Curve No. 3 appears to be the best fit without changing the values of K_1 too severely from those previously estimated. The principal conclusion is that there is a heavy benthal demand which is assumed to equal the reaeration above the Sill.

PEARL RIVER SURVEY - LOUISIANA-MISSISSIPPI

AVERAGE D.O. DEFICIT, 1000 LBS./DAY

TABLE No. C-4

Station	n	Flow	°C	Sat. D.O.	D.O.	Deficit
P77	10	1905	25	86.2	77.9	8.3
P76	6	2072	25	93.8	84.4	9.4
BLO	13	50	30	2.1	0.0	2.1
P74	3	2178	28	93.1	64.6	28.5
P71	15	2012	25	91.0	57.4	33.6
P64	16	2018	25	91.3	43.8	57.5
P63	12	1986	25	89.9	61.9	28.0
P60	11	1957	25	88.6	60.1	28.5
P57	11	1957	24	90.1	59.7	30.4
P53	10	1941	24	89.4	58.8	30.6
P50	11	1957	25	88.6	57.5	31.1
P46	12	1965	25	88.9	55.8	33.1
P42	13	1976	25	89.4	58.4	31.0

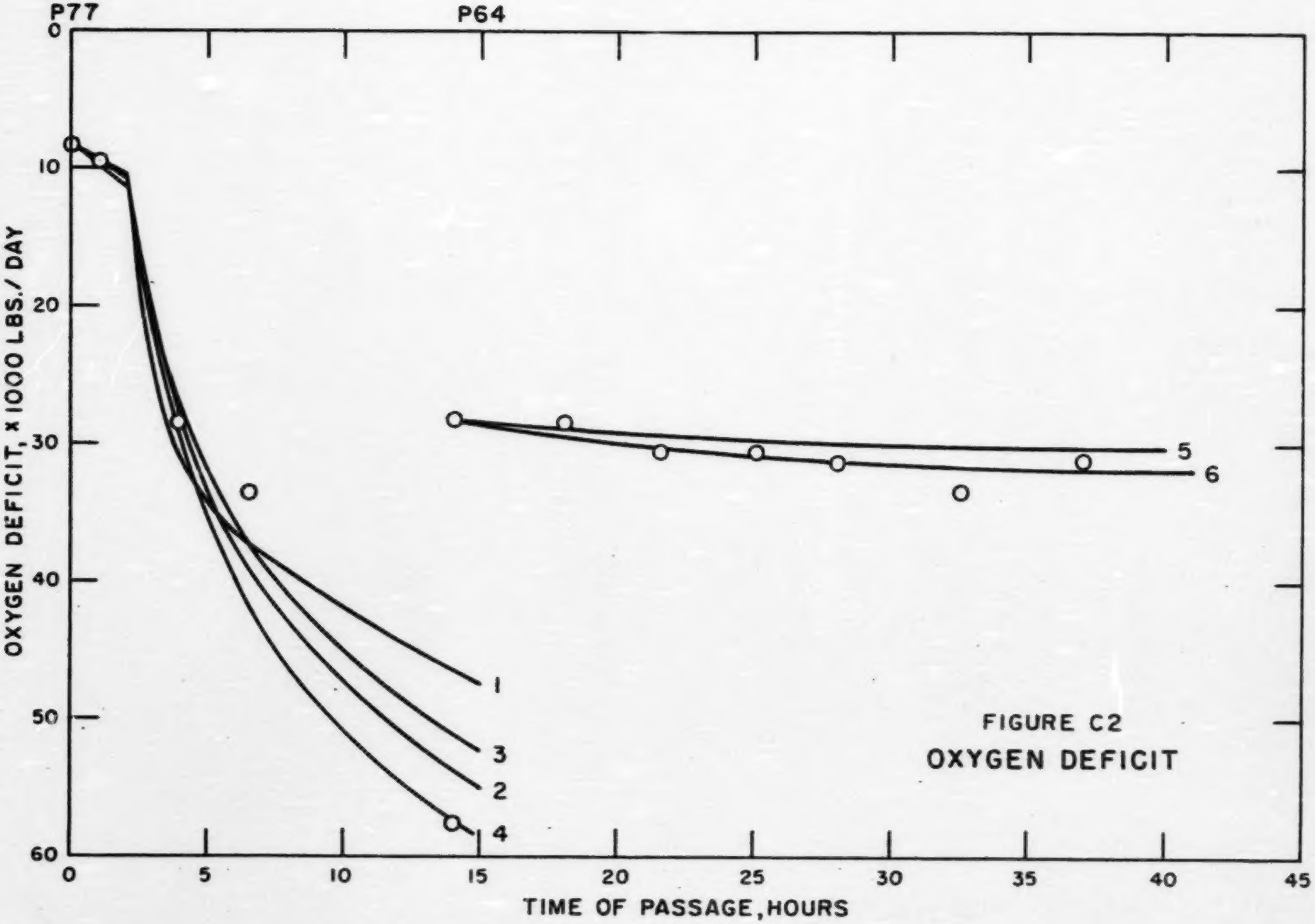


FIGURE C2

OXYGEN DEFICIT

PEARL RIVER SURVEY - LOUISIANA-MISSISSIPPI

VALUES OF K_1 and K_2/HR. IN THE STREAM

TABLE NO. C-5

ABOVE THE SILL

Curve	L_{77}	L_{75}	S_{75}	D_{77}	$K_{1(77)}$	$K_{1(75)}$	$K_{3(75)}$	K_2
1	30.2	51	21	8.3	0.035	0.008	1.0	0.00
2	30.2	51	21	8.3	0.05	0.015	0.5	0.00
3	30.2	51	21	8.3	0.04	0.015	0.5	0.00
4	30.2	51	21	8.3	0.04	0.05	0.5	0.015

BELOW THE SILL

	L_{64}	D_{64}	$K_{1(64)}$	K_2
5	77	28	0.010	0.02
6	77	28	0.012	0.022

Curve No. 4 (Figure C2) assumes a K_1 value of 1.2 per day for the observed B.O.D. load from Bogue Lusa Creek in order to account for the benthal demand and the reaeration constant K_2 then has a value of 0.36 per day. This K_1 value of 1.2 is about 5 times the value determined in the long-term B.O.D. bottles.

For deficit curves below the Sill, the ultimate B.O.D. load is estimated at P-64, from Figure C1, to be 77,000 pounds per day and the observed average D.O. deficit of 8,300 pounds per day below the Sill is used. Curves No. 5 and No. 6 are two estimates of the values below the Sill, which are tabulated in Table C5. Curve No. 6 appears to be best fit obtainable with the computer, and K_2 has a value of 0.53 per day. Using Churchill's method[11] the K_2 values for this stream would be expected to fall between 0.4 and 0.6 per day.

The ratio of oxygen deficits in the stream above and below the Sill are plotted against flow rates, in Figure C3, in order to estimate the reaeration to be expected as the water falls over the dam.

The simulating analog computer circuit may be represented as shown in Figure C4.

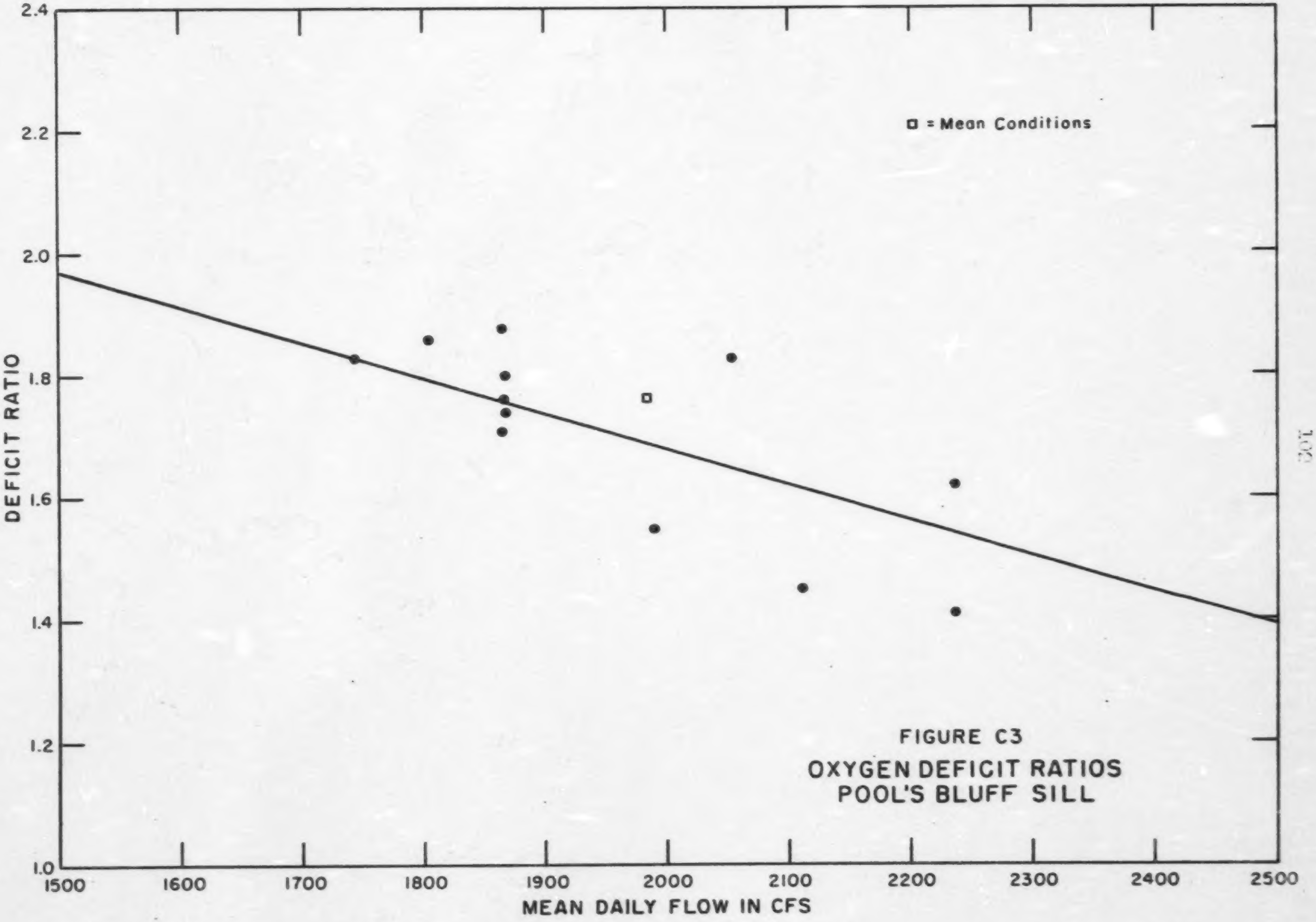
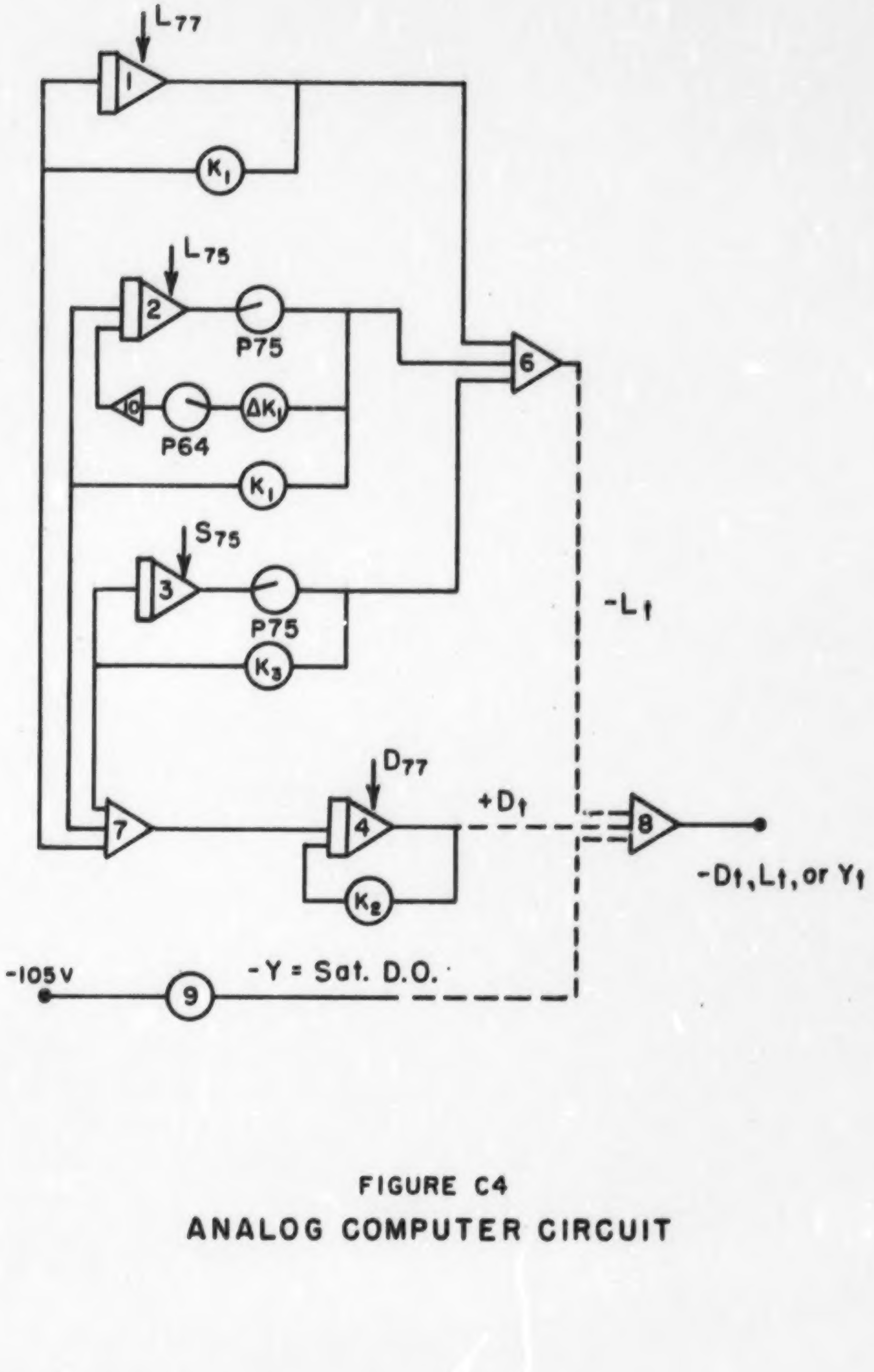


FIGURE C3

OXYGEN DEFICIT RATIOS
POOL'S BLUFF SILL



L_{77}
1
K_1
L_{75}
2
P75
10
P64
ΔK_1
K_1
6
S_{75}
3
P75
K_3
$-L_t$
D_{77}
7
4
$+D_t$
K_2
8
$-D_t, L_t$, or Y_t
-105 V
9
$-Y$ = Sat. D.O.

FIGURE C4

ANALOG COMPUTER CIRCUIT

Projected Oxygen Deficits

In order to estimate the future oxygen deficits at low flows, two different load conditions were assumed at the mouth of Bogue Lusa Creek (P-75), one for the observed load during the survey and the other for a future load of 62,000 pounds per day of primary treated pulp and paper mill wastes. Any wastes discharged from the City of Bogalusa after the sewage treatment plant is in operation were considered negligible if no oxidation is assumed to take place in the mill wastes during the time of passage in Bogue Lusa Creek.

Table C6 is a tabulation of the values submitted to the analog computer and the results obtained. Values of dissolved oxygen in thousands of pounds per day were the values plotted or drawn by the computer. Ultimate B.O.D. and oxygen deficit values at P-64 were read out on the computer voltmeter. Values were computed for the reach from P-77 to P-64, above the Sill, the reaeration over the Sill was estimated by deficit ratios, (Fig. C3) and a second computation was made from P-64 to below the downstream sag point. Some selected curves are reproduced on Figure C5. Curves for dissolved oxygen in mg/l are presented in Fig. 10 of the main part of the report.

PEARL RIVER SURVEY - LOUISIANA-MISSISSIPPI

OXYGEN SAG CALCULATIONS

TABLE NO. C6

					PTI									BLO			
Curve No.	Flow cfs	Temp. °C	Sat. D.O. mg/1	Sat. D.O. 1000#/day	D.O. mg/1	D.O. 1000#/day	Def. 1000#/day	K_2/day	K_2/hr.	B.O.D. mg/1	Ult. B.O.D. 1000#/day	K_1/day	K_1/hr.	B.O.D. 1000#/day	Ult. B.O.D. 1000#/day	K_1/day	K_1/hr.
1	2000	25	8.4	90.6	8.0	86.2	4.4	0.00	0.00	2.0	31.6	0.96	0.04	34.0	50.0	0.36	0.015
2	2000	25	8.4	90.6	8.0	86.2	4.4	0.36	0.015	2.0	31.6	0.96	0.04	34.0	50.0	1.20	0.05
3	2000	25	8.4	90.6	8.0	86.2	4.4	0.00	0.00	2.0	31.6	0.96	0.04	45.0	67.5	0.36	0.015
4	2000	25	8.4	90.6	8.0	86.2	4.4	0.36	0.015	2.0	31.6	0.96	0.04	45.0	67.5	1.20	0.05
5	2000	30	7.6	82.0	7.0	75.5	6.5	0.00	0.00	2.0	31.6	1.25	0.05	34.0	50.0	0.45	0.019
6	2000	30	7.6	82.0	7.0	75.5	6.5	0.45	0.019	2.0	31.6	1.25	0.05	34.0	50.0	1.5	0.062
7	2000	30	7.6	82.0	7.0	75.5	6.5	0.00	0.00	2.0	31.6	1.25	0.05	45.0	67.5	0.45	0.019
8	2000	30	7.6	82.0	7.0	75.5	6.5	0.45	0.019	2.0	31.6	1.25	0.05	45.0	67.5	1.5	0.062
9	1500	25	8.4	68.0	8.0	65.0	3.0	0.00	0.00	2.0	24.2	0.96	0.04	34.0	50.0	0.36	0.015
10	1500	25	8.4	68.0	8.0	65.0	3.0	0.36	0.015	2.0	24.2	0.96	0.04	45.0	67.5	1.20	0.05
11	1500	30	7.6	61.5	7.0	56.7	4.8	0.00	0.00	2.0	24.2	1.25	0.05	34.0	50.0	0.45	0.019
12	1500	30	7.6	61.5	7.0	56.7	4.8	0.45	0.019	2.0	24.2	1.25	0.05	45.0	67.5	1.5	0.062
13	1100	25	8.4	49.8	8.0	47.5	2.3	0.00	0.00	2.0	11.9	0.96	0.04	34.0	50.0	0.36	0.015
14	1100	25	8.4	49.8	8.0	47.5	2.3	0.36	0.015	2.0	11.9	0.96	0.04	45.0	67.5	1.20	0.05
15	1100	30	7.6	45.0	7.0	41.5	3.5	0.00	0.00	2.0	11.9	1.25	0.05	34.0	50.0	0.45	0.019
16	1100	30	7.6	45.0	7.0	41.5	3.5	0.45	0.019	2.0	11.9	1.25	0.05	45.0	67.5	1.5	0.062
Primary Sedimentation - No Benthal Demand														BLO = Zero D.O.			
17	2000	25	8.4	90.6	8.0	86.2	4.4	0.36	0.015	2.0	31.6	0.96	0.04	45.0	67.5	0.36	0.015
18	2000	30	7.6	82.0	7.0	75.5	6.5	0.45	0.019	2.0	31.6	1.25	0.05	45.0	67.5	0.45	0.019
19	1500	30	7.6	61.5	7.0	56.7	4.8	0.45	0.019	2.0	24.2	1.25	0.05	45.0	67.5	0.45	0.019
20	1100	25	8.4	49.8	8.0	47.5	2.3	0.36	0.015	2.0	11.9	0.96	0.04	45.0	67.5	0.36	0.015
Future Condition - 62,000 lbs. B.O.D./day																	
21	2000	25	8.4	90.6	8.0	86.2	4.4	0.36	0.015	2.0	31.6	0.96	0.04	62.0	92.5	0.36	0.015
22	2000	30	7.6	82.0	7.0	75.5	6.5	0.45	0.019	2.0	31.6	1.25	0.05	62.0	92.5	0.45	0.019
23	1500	30	7.6	61.5	7.0	56.7	4.8	0.45	0.019	2.0	24.2	1.25	0.05	62.0	92.5	0.45	0.019
24	1100	25	8.4	49.8	8.0	47.5	2.3	0.36	0.015	2.0	11.9	0.96	0.04	62.0	92.5	0.36	0.015
24A	1100	30	7.6	45.0	7.0	41.5	3.5	0.45	0.019	2.0	11.9	1.25	0.05	62.0	92.5	0.45	0.019
Low Reaeration Rates																	
25	1500	30	7.6	61.5	7.0	56.7	4.8	0.22	0.009	2.0	24.2	1.25	0.05	62	92.5	0.45	0.019
26	1500	30	7.6	61.5	7.0	56.7	4.8	0.22	0.009	2.0	24.2	1.25	0.05	62	92.5	1.25	0.051
27	1500	30	7.6	61.5	7.0	56.7	4.8	0.22	0.009	2.0	24.2	1.25	0.05	62	92.5	0.45	0.019
Changed Conditions at PTI (See No. 23)																	
28	1500	30	7.6	61.5	6.0	48.5	13.0	0.45	0.019	3.0	36.3	1.25	0.05	62	92.5	0.45	0.051
29	1500	30	7.6	61.5	6.0	48.5	13.0	0.22	0.009	3.0	36.3	1.25	0.05	62	92.5	0.45	0.051

PEARL RIVER SURVEY - LOUISIANA-MISSISSIPPI

TABLE NO. C6

OXYGEN SAG CALCULATIONS
(Cont'd.)

			P75 Immed. Demand			P63.5						P63.2				Sag Point		
Curve No.	Flow cfs	Temp. °C	B.O.D. 1000#/day	Ult. B.O.D. 1000#/day	K_3/hr.	Ult. B.O.D. 1000#/day	K_1/day	K_1/hr.	D.O. 1000#/day	D.O. mg/1	Def. 1000#/day	Def. Ratio	Def. 1000#/day	K_2/day	K_2/hr.	Time Hrs.	D.O. 1000#/day	D.O. mg/1
1	2000	25	12.0	18.0	0.50	62.0	0.29	0.012	45.5	4.2	44.5	1.7	26.2	0.53	0.021	32.5	62.5	5.8
2	2000	25	12.0	18.0	0.50	47.0	0.29	0.012	38.0	3.5	52.0	1.7	30.6	0.53	0.021	14.2	59.7	5.5
3	2000	25	-	-	-	77.0	0.29	0.012	62.0	5.8	29.0	1.7	17.2	0.53	0.021	50+	63.7	5.9
4	2000	25	-	-	-	56.0	0.29	0.012	47.5	4.3	44.0	1.7	25.8	0.53	0.021	27.5	64.5	6.0
5	2000	30	12.0	18.0	0.63	56.0	0.36	0.015	31.0	2.9	52.0	1.7	30.6	0.67	0.028	14.2	50.5	4.7
6	2000	30	12.0	18.0	0.63	41.0	0.36	0.015	25.0	2.3	58.0	1.7	34.1	0.67	0.028	14.2	47.0	4.4
7	2000	30	-	-	-	71.0	0.36	0.015	45.0	4.2	36.5	1.7	21.4	0.67	0.028	40.0	55.0	5.1
8	2000	30	-	-	-	48.5	0.36	0.015	32.0	3.0	50.3	1.7	29.6	0.67	0.028	14.2	51.5	4.8
9	1500	25	12.0	18.0	0.50	57.0	0.29	0.012	28.0	3.5	40.0	2.0	20.0	0.53	0.021	41.0	43.9	5.4
10	1500	25	-	-	-	51.0	0.29	0.012	27.5	3.4	40.0	2.0	20.0	0.53	0.021	36.5	45.0	5.6
11	1500	30	12.0	18.0	0.50	52.0	0.36	0.015	17.5	2.2	45.0	2.0	22.5	0.67	0.028	25.0	37.0	4.6
12	1500	30	-	-	-	44.0	0.36	0.015	17.3	2.1	46.0	2.0	23.0	0.67	0.028	14.2	37.3	4.6
13	1100	25	12.0	18.0	0.5	50.0	0.29	0.012	15.0	2.5	33.5	2.2	15.3	0.53	0.021	50+	30.0	5.1
14	1100	25	-	-	-	44.0	0.29	0.012	15.0	2.5	34.5	2.2	15.7	0.53	0.021	47.5	31.9	5.4
15	1100	30	12.0	18.0	0.5	46.0	0.36	0.015	6.6	1.1	38.0	2.2	17.3	0.67	0.028	31.0	26.1	4.4
16	1100	30	-	-	-	38.0	0.36	0.015	5.0	0.8	40.0	2.2	18.2	0.67	0.028	15.0	26.5	4.5
17	2000	25	2.2	2.2	1.0	77.0	0.29	0.012	63.5	5.9	28.0	1.7	16.5	0.53	0.021	55.0	64.5	6.0
18	2000	30	2.1	2.1	1.0	72.0	0.36	0.015	50.0	4.6	32.0	1.7	18.8	0.67	0.028	42.0	57.8	5.4
19	1500	30	2.1	2.1	1.0	68.0	0.36	0.015	33.8	4.2	28.0	2.0	14.0	0.67	0.028	47.0	40.0	4.4
20	1100	25	2.2	2.2	1.0	63.0	0.29	0.012	32.0	5.4	19.0	2.2	8.6	0.53	0.021	60.0	30.0	5.0
21	2000	25	2.2	2.2	1.0	97.0	0.29	0.012	60.0	5.6	32.0	1.7	18.8	0.53	0.021	60.0	59.0	5.5
22	2000	30	2.1	2.1	1.0	91.0	0.36	0.015	45.3	4.2	38.0	1.7	22.4	0.67	0.028	41.5	51.8	4.7
23	1500	30	2.1	2.1	1.0	87.0	0.36	0.015	29.0	3.6	32.5	2.0	16.3	0.67	0.028	49.0	33.9	4.2
24	1100	25	2.2	2.2	1.0	86.0	0.29	0.012	28.5	4.8	22.0	2.2	10.0	0.53	0.021	65.0	23.9	4.0
24A	1100	30	2.1	2.1	1.0	80.0	0.36	0.015	20.0	3.0	25.0	2.2	11.4	0.67	0.028	54.0	20.8	3.1
25	1500	30	2.2	2.2	1.0	87.0	0.36	0.015	26.0	3.2	36.0	2.0	18.0	-	0.014	65.0	22.0	2.7
26	1500	30	2.2	2.2	1.0	65.0	0.36	0.015	4.0	0.5	58.0	2.0	29.0	-	0.014	43.0	24.3	3.0
27	1500	30	5.0	5.0	0.6	87.5	0.36	0.015	23.5	2.9	38.0	2.0	19.0	-	0.014	65.0	21.2	2.6
28	1500	30	5.0	5.0	0.6	70.0	0.36	0.015	0.0	0.0	70.0	2.0	35.0	-	0.028	17.5	26.1	3.2
29	1500	30	5.0	5.0	0.6	70.0	0.36	0.015	0.0	0.0	75.0	2.0	37.5	-	0.014	48.0	16.0	2.0

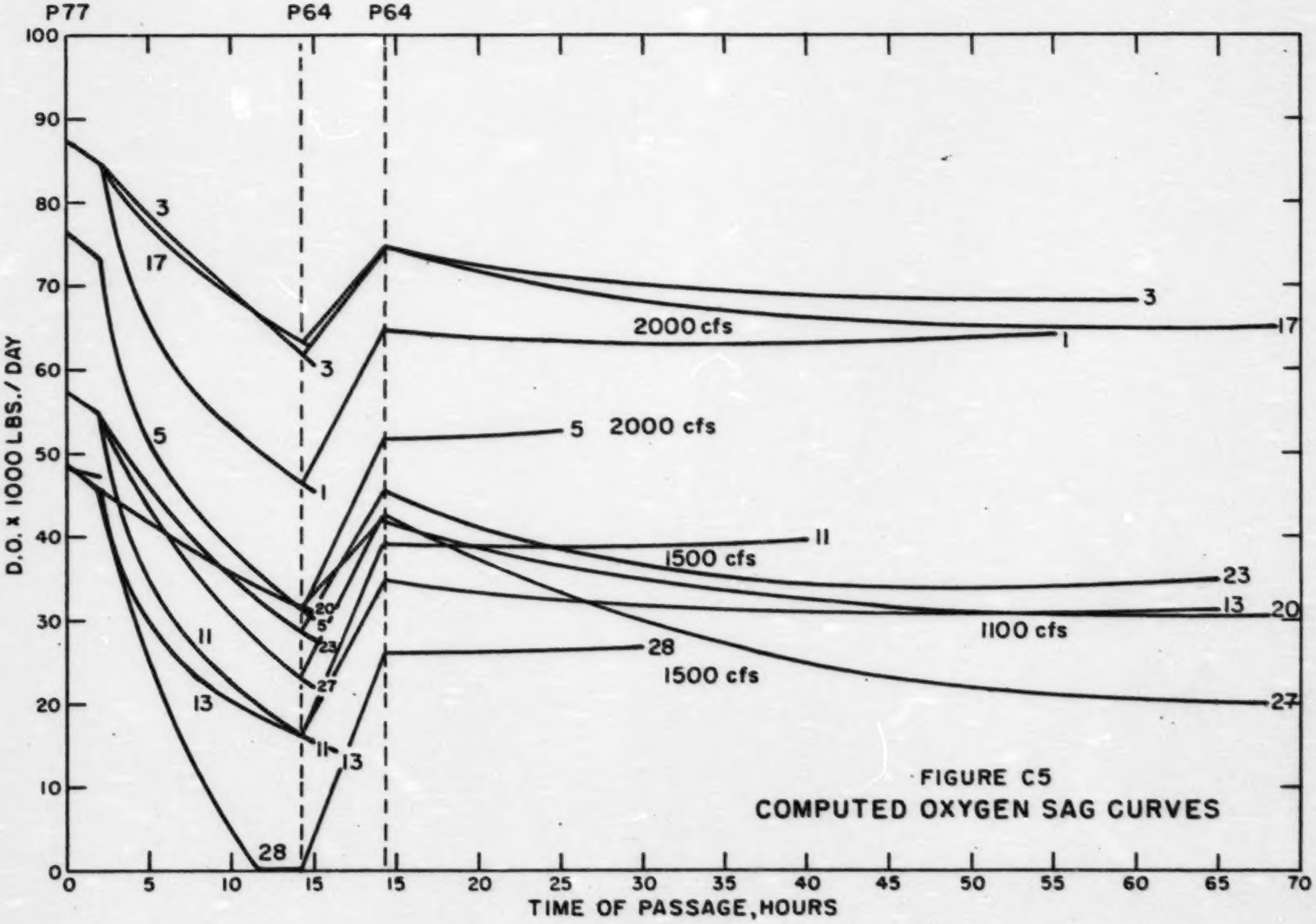


FIGURE C5
COMPUTED OXYGEN SAG CURVES

Existing Waste Load

Curves 1 through 4 were for conditions similar to those for the survey period. For Curves 1 and 3 the benthal demand was assumed to equal the reaeration and that there was no net reaeration. In Curve 1 it was assumed that there was immediate demand load applied at P-75, in addition to the observed discharge from Bogue Lusa Creek, while in Curve 3 the immediate demand was deleted and the load from Bogue Lusa Creek was increased accordingly. The conditions for Curve 3 do not appear to be a satisfactory analogy. For Curves 2 and 4 the benthal demand was represented by a higher value of K_1, and K_2 was estimated to be 0.36 per day. Curve 2 assumed an immediate demand from Bogue Lusa Creek, while Curve 4 increased the total load from Bogue Lusa Creek to adjust for the immediate demand, similar to Curve 3. Curve 4 gave about the same result at P-64 as Curve 1. Curve 2 appeared to represent an unduly severe condition.

Curves 5 through 8 are similar to the previous curves, except a water temperature of 30°C (86°F) was assumed. Similar comments may be made and Curves 6 and 7 are not considered to be analogous to stream conditions.

Curves 9 through 12 are for flows of 1,500 cfs, which may occur for at least one day each year. At a water temperature of 30°C, the D.O. may be expected to be less than 3 mg/l above Pool's Bluff Sill under waste discharge conditions such as those existing during the period of the survey.

Curves 13 through 16 are for stream flows of 1,100 cfs, which may prevail for a period of seven days, once in ten years. Nuisance conditions would be expected above Pool's Bluff Sill if the mill wastes are not improved over conditions during the survey.

Existing Load with Sedimentation

Curves 17 through 20 represent a load of 45,000 pounds per day of B.O.D. from Bogue Lusa Creek without any immediate demand or any benthal demand, as would be expected if the mill wastes are treated by primary sedimentation. For the assumed conditions, the D.O. in the stream would not be less than 4 mg/l.

Future Conditions

Curves 21 through 24A are for a future load of 62,000 pounds per day of B.O.D. from Bogue Lusa Creek after primary treatment of the mill wastes.

In the various hypothetical conditions, the constants were assumed to not change substantially with rate of stream flow. Curves 25, 26, and 27 are for lower reaeration rate with flows of 1,500 cfs at 30°C; a generally more critical condition than 1,100 cfs at 25°C. Curve 26 assumes a benthal demand represented by a high K_1 rate, and nuisance conditions would be expected above Pool's Bluff Sill. For Curves 25 and 27 the D.O. would be expected to be less than 3 mg/l below the Sill, with the sag occurring 65 hours below P-77.

In all of the previous 27 cases, it was assumed that the conditions at P-77 could be represented as 2 mg/l of B.O.D., 8 mg/l D.O. at 25°C and 7 mg/l D.O. at 30°C. For the same conditions as for Curve 23, except 6 mg/l D.O. and 3 mg/l B.O.D. at P-77, the condition above Pool's Bluff Sill would be very unsatisfactory with anaerobic conditions to be expected.

REFERENCES

1. McDermott, Gerald N. "The Effect of Kraft Pulp and Paper Mill Wastes on Pearl River." La. Stream Control Comm., Baton Rouge, La., and Federal Security Agency, Environmental Health Center, Cincinnati, Ohio, 66 pp. + tables and figures. (October 1950).

2. Lafleur, R. A. and Gregg, R. T. "A Biological and Chemical Survey of Pearl River." A report submitted to the director of the Louisiana Wildlife and Fisheries Comm. and members of the Louisiana Stream Control Comm., mimeographed report, 14 pp + figures and tables. (August 1962).

3. Lafleur, R. A. and Gregg, R. T. "Addendum to a Biological and Chemical Survey of Pearl River." (October 1962).

4. Anon. "Louisiana Oyster Water Survey, 1962, Pearl River-Mississippi Sound." Louisiana State Board of Health.

5. Ervine, H. C. "Report on the Louisiana Oyster Growing Areas of Mississippi Sound." U. S. Dept. of Health, Education, and Welfare, Public Health Service, Dallas, Texas, January 18, 1962.

6. Welch, P. S. "Limnology." McGraw-Hill, N.Y., 538 pp. (1952).

7. VanHorn, W. M., Anderson, J. B., Katz, M. "The Effect of Kraft Pulp Mill Wastes on Some Aquatic Organisms." Am. Fish. Soc. 79, pp. 55-63. (1949).

8. Anon. "Summary Report on Quality of Interstate Waters Pearl River (Louisiana-Mississippi)." U. S. Dept. Health, Education, and Welfare, Public Health Service, 12 pp. mimeographed report. (October 1960).

9. Carlander, K. D. "Handbook of Freshwater Fishery Biology with the First Supplement." Wm. C. Brown Co., Dubuque, Iowa, 429 pp. (1953).

10. Grantham, Billy J. "Completion Report of Pollution Studies on the Pearl River, 1959-1960." Fisheries & Pollution Divisions, Miss. Game and Fish Comm., 83 pp. (mimeographed).

11. Churchill, M. A. "Waste Assimulative Capacity of Streams." First Sanitary Engineering Conference, Vanderbilt Univ. Dept. of Civil Engr., p. 126.

12. Biglane, K. E. Report to Louisiana Stream Control Commission, August 10, 1960.